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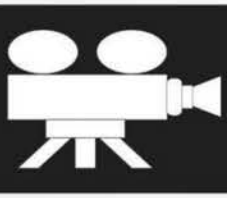
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CHAPTER 1 INTRODUCTION

Economics has been recognized as a special area of study for over a century. Economics and economists are words that almost everyone has heard of and used. But, what exactly is economics? Very few people can give a good definition or description of what this field of study is all about. If ordinary citizens cannot give a good definition or description of economics, they can be excused because even economists struggled long to define their own field . We have to perform various and varied activities throughout the day. After attaining adulthood, we have our own family and we are required to make arrangement for food, clothes, house and other necessaries of life for the members of our family. We have to activate ourselves to earn something, so that we may be able to meet the expenses. Our activities to generate income are termed as economic activities, which are responsible for the origin and development of economics as subject. Economics was originally introduced as a science of statecraft. It was concerned with the collection of revenue for the state i.e., government. Therefore, it become essential to acquaint students with basics of Economics

Economics:

Economics is a subject matter that studies different economic activities as directed towards the *maximization of satisfaction or maximization of profit* at the level of an individual, and maximization of social welfare at the level of the country as a whole .Economics can be defined as a study of an economic system in all its aspects – **structure, working, performance, problems, and their possible solutions.**

The word 'Economics' is derived from the Greek word ***'Oikonomia'*** which can be divided into two parts : (***a*)'*Oikos*'**, which means 'House', and(***b*) '*Nomos*',** which means 'Management'. Together they mean managing household. The coverage of economics is broader than the meaning of the word 'Economics'.

Economic Activity:

By an economic activity we mean that activity which is based on or is related to the *use of scarce resources* for the satisfaction of human wants.

Examples- Consumption, Investment

Non-Economic Activity:

Non- economic activity are those do *not* need the consumption of goods and service.

Scarcity:

It is a situation when demand for a good exceeds its supply even at a zero price.

Demand > Supply, at zero price = Scarcity

Economic Problem:

It is the problem of choice arising out of the fact that-

(i) Resources are scarce

(ii) Resources can be allocated to alternative uses.

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SOME LEADING DEFINITIONS ARE AS FOLLOWS

WEALTH DEFINITION

Economics as a Science of Wealth:

This preference of viewing economics as a science of wealth is highlighted in the stand taken by the "Father of Economics", namely, Adam Smith. In this classic work **An Enquiry into the Nature and Causes of the Wealth of Nations, p**ublished in 1776, he maintains that the discipline of economics is meant to identify the factors (that is causes) which make one economy richer than the other.

Features of wealth definition

- ignores the problem of distributive justice
- wealth do not have universal meaning
- wealth represents only material goods

WELFARE DEFINITION

Economics as a Science of Material well-being:

Professor Dr. Alfred Marshall was the first economist who gave a logical definition of economics. He defined economics as: **"A study of mankind in ordinary business of life, it examines that part of individual and social actions which is closely related with attainment and use of material requisites".**

CHARACTERISTICS OF MARSHALLS DEFINITION:

(i) A Social Science

This Definition makes economics a social science. It is a subject that is concerned with the people living in society.

(ii) Study of Man

Economics is related to man; therefore it is living subject. It discusses economic problems and behavior of man. According to Marshall it studies the behavior of man in ordinary business of life.

(iii) Wealth as a means of Material Well Being

According to Marshall, wealth is not the ultimate objective of human activities and therefore we do not study wealth, for the sake of wealth. Therefore according to this definition we study wealth as a source of attainment of material welfare.

(iv) Economics and Welfare

This definition makes economics welfare oriented subject. We are concerned only with *those economic activities which promote welfare a*nd the activities which do not promote welfare of human beings are out of the scope of economics.

(v) Materiality

Marshal stresses upon the concept of "material requisite of well being". Therefore according to this definition all economic activities resolve around the acquisition and use of

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material goods like food, clothing etc. because they increase welfare of human beings. On the other hand non-material requisites of human life like education, recreation are ignored.

(vi) Normative Outlook

According to this definition economics should take care of good and bad aspects of economic activities and therefore involve itself in "what should be and what should not be". This is called normative aspect of economics.

SCIENTIFIC AND CHOICE DEFINITION

Economics as a Science of Choice Making:

"Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses." - Lionel Robbins

Feature of definition:

1. **Economics is a human science:** According to Robbins, economics is a human science means that economics studies every human being whether he forms a part of the society or not he performs social action or not. For e.g., a saint living in the caves of the Himalayas also form the part of economics studies.
2. **Economics is a Science :** According to Robins, economics is a science because of follows characteristics :
   - **i.** Systematized study
   - **ii.** Based on cause Study & effect relationship
   - **iii.** Existence of Laws and Principles
   - **iv.** Practical verification possible
3. **Human wants are unlimited :** According to Robbins, human wants are unlimited. It is all because of his highly development brain. He cares for what he not, without caring for what he has. As a result want keeps on cropping.
4. **Means are Scarce :** Means to satisfy human wants are less in number as compared to the volume of wants.
5. **Means Have alternative uses :** According to Robbins, means satisfy human wants have alternative uses as well. For e.g., Electricity can have numerous uses.
6. **Economic Problems :** Economic Problems is also called "The problems of Choice Making" arises on account of unlimited human wants to be satisfied with scarce having alternative uses. Thus a person under such situation has to make choice between various wants on the basis of their urgency. This problem of choice making is called Economics Problem.
7. **Positive Science :** According to Robbins, positive science is a science which studies what is the realistic situation? Robin's says in this context that "Economics is entirely neutral between its ends" i.e., an economist has nothings to do with goodness or badness of wants.

GROWTH AND SCARCITY DEFINITION

Economics as a Science of Dynamic growth and development:

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"Economics is the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to product various commodities time and distribute them for consumption now and in the future amongst various people and groups of society. It analyses the costs and benefits of improving patterns of resource allocations."

Paul A. Samuelson

NATURE OF ECONOMICS

Economics – As a Science and an Art

Economics hold different view as regards the questions whether economics is science or an art.

The term 'science' connotes the following:

1. Systematized body of knowledge.
2. Based on cause and effect relationship.
3. Existence of laws and principles.
4. Practical verification possible.

If we analyses economics as a discipline we find that it fulfills to all the features of science. Like science, economics is also a systematized body of Knowledge. The various facts relevant to it are systematically collected, classified and analyzed.

For e.g., the famous law of demand, explain the cause and effect relationship between price and demand for a commodity. As the price rises the demand for a commodity falls, and vice versa. Here, rise in price is the cause and resultant fall in demand is the effect.

Economics is termed as ART because

1. It is knowledge put into practice
2. It is the process through which the state is run
3. It studies about the human behaviour

Further Economics as a Science can be broadly classified as:

Positive science: positive or pure science analyses cause and effect relationship between variables but it does not pass value judgment. In other words, it states what is and not what ought to be. Positive statements are about facts. They state what the reality is. According to Robbins, economics is concerned only with the study of the economic decisions of individuals and the society as positive facts but not with the ethics of these decisions. Economics should be neutral between ends. It is not for economists to pass value judgments and make pronouncements on the goodness or otherwise of human decisions. An individual with a limited amount of money may use it for buying liquor and not milk, but that is entirely his business. A community may use its limited resources for making guns rather than butter, but it is no concern of the economists to condemn or appreciate this policy. Economics only studies facts and makes generalizations from them. It is a pure and positive science, which excludes from its scope the normative aspect of human behaviour. In pure science the analysis is confined to cause and effect relationship. Economics is not to suggest but simply state in terms of cause and effect

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relations and leave the matter of choice to the individual concerned whether it suites his requirements or not.

This aspect is given by Robbins.

Example: as price falls demand tends to rise if ceteris paribus

Normative Science : Normative economics is concerned with normative statements. Normative statements are concerned with what ought to be? In this case, economics is not concerned with facts rather it is concerned with how things should be. As normative science, economics involves value judgments. It is prescriptive in nature and describe 'what ought to be' or 'what should be the things'. For example, the questions like what should be the level of national income, what should be the wage rate, how much of national product be distributed among people - all fall within the scope of normative economics. Thus, normative economics is concerned with welfare propositions In this model Economics emphasize for finding out and prescribing course of action which is desirable and necessary to achieve certain social goals.

This aspect was given by Marshall.

Example: there should be substantial effort from government to eradicate poverty.

DIFFERENT TYPES OF ECONOMICS

1. **Micro Economics**: it is that branch of economics that studies about the individual unit be it person, firm or factor. The subject matter of microeconomics includes price theory, distribution of wealth and factor distribution.

   Example: demand and supply determines the price of a product

2. **Macro Economics**: it is that branch of economics that deals with the aggregates of the variables like total income of the nation or unemployment of the nation. Mainly it constitutes the process and methods which are used to run the economy or state.

   Example: the unemployment and inflation of the country is a huge problem for the government.

3. **Public finance**: it is that branch of economics that deals with the revenue and expenditure of the government to finance the public projects. It constitutes with all such policy decisions related to taxes and basis of it.

   Example: government is contemplating on using proportional taxes instead of lump sum taxes.

4. **International trade** : it constitutes of policies ,problems , solutions and other issues related with bilateral trade or multilateral trade.

   Example : WTO has always tried to resolve the problems related to TRIPS, TRIMS

5. **Urban and rural economics**: it includes that branch of economics which is related to the strategy which will solve the problems or rural economy and urban economy , it deals with urbanization, migration of labour, congestion etc

   Example : due to migration of labour from rural to urban area the problems of urban area has aggravated.

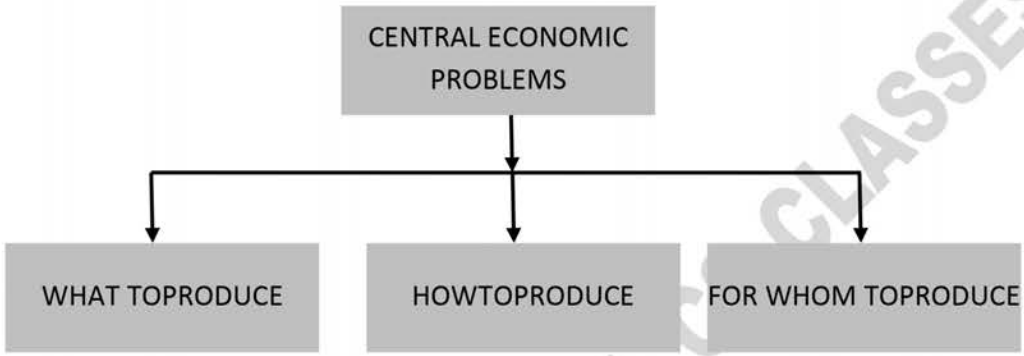
6. **Positive economics**: this viewpoint of studying economics was give buy Robbbins. It deals with facts, rationality, causal relation and anything which is real truth which can be verified.

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Example: unemployment in India is 6%.

7. **Normative economics**: it deals with the ethics and judgmental part of economic facts. It constitutes of analysis of those topics which is related to "should, would be, ought to be " etc. there is strong ethical sense in this.
   Example: government should not do anything which aggravates the current level of poverty.

CENTRAL ECONOMIC PROBLEMS



These central problems may be summarized as follows:

What to produce? :

Since the economy is not able to produce everything, therefore it has to decide between which goods and services to produce and which ones to leave out.

How to produce? : Since the available resources can be used in several ways for producing goods and services, it has to decide allocation of resources that is which resources should be employed for producing which goods and services. A society has to decide whether to use **labour intensivetechniques or capital intensive techniques**. Obviously, the choice would depend on the availability of different factors of production and their relative prices. It is in the society's interest to use those techniques of production that make best use of the available resources.

For whom to produce? Another important decision which a society has to take for whom to produce. The society cannot satisfy all wants of all the people.

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CAPITALISTIC ECONOMY

Capitalism is an economic system in which all the means of production are owned and controlled by private individuals for profit. In short, private property is the mainstay of capitalism and profit motive is its driving force. The government is not supposed to interfere in the management of economic affairs under this system. An economy is called capitalist or a free market economy if it has the following characteristics:

(1) **The right of private property:** the right of private property means that productive factors such as land, factories, machinery, mines, etc. are under private ownership. The owners of these factors are free to use them in the manner in which they like. The government may, however, put some restrictions for the benefit of the society in general.

(2) **Freedom of enterprise:** This means that everybody engages in any economic activity he likes. More specifically he is free to set up any firm to produce goods.

(3) **Freedom to choice by the consumers:** this means people in a capitalist economy are free to spend their income as they like. This is known as consumer sovereignty. Consumers are sovereign in the sense producers produce only those goods which consumers wish to buy.

(4) **Profit motive:** In a capitalist economy it is the profit motive which forces or induces people to work and produce.

(5) **Competition:** Competition prevails among sellers to sell their goods and among buyers to obtain goods to satisfy their wants. Advertisement, price-cutting, discounts, etc. are very common methods of competition in a capitalist economy.

(6) **Inequalities of income:** There is generally a wide gap of income between the rich and the poor in the economy which mainly arises due to unequal distribution of property in such economies.

How capitalist economies solve their central problems?

A capitalist economy has no central planning authority to decide what, how and for whom to produce. In absence of any central authority it looks like a miracle as to how such an economy functions. If the consumers want cars, producers choose to make cloth and workers choose to work for the furniture industry, there will be total confusion and chaos in the country. But this is not so. Such an economy uses the impersonal forces of the market demand and supply or the price mechanism to solve its central problems.

Deciding what to produce: The aim of an entrepreneur is to earn as much profits as possible. This causes businessmen to compete with one another to produce those goods which consumers wish to buy. Thus, if consumers want more cars, there will be an increase in the demand for cars and as a result their prices will increase. A rise in the price of cars, cost remaining the same, will lead to more profits. This will induce producers to produce more cars. On the other hand, if the consumers' demand for cloth decreases, its price would fall and profits would go down and hence its production would also go down. Thus, more of cars and less of cloth will be produced in such an economy. Thus, in a capitalist economy (like the USA, UK, and

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Germany) the question regarding what to produce is ultimately decided by consumers who show their preferences by spending on the goods which they want.

Deciding how to produce: An entrepreneur will produce his goods with that technique of production which renders his cost of production minimum. If labour is relatively cheap he will use labour intensive method and if labour is relatively costlier he will use capital intensive method. Thus, the relative prices of factors of production help in deciding how to produce.

Deciding for whom to produce: Goods and services in a capitalist economy will be produced for those who have the buying capacity. The buying capacity of an individual depends upon his income. How much income he will be able to make depends not only on the amount of work he does and the prices of the factors he owns but also on how much property he owns. Higher the income, higher will be his buying capacity and higher generally will be his demand for goods in general.

Merits of Capitalist Economy:

(1) To attract the consumer the producer will bring out newer and finer varieties of goods.
(2) The existence of private property and the driving force of profit motive results in high standard of living.
(3) Capitalism works automatically through the price mechanism.
(4) The freedom of enterprise results in maximum efficiency in production.
(5) All activities under capitalism enjoy the maximum amount of liberty and freedom.
(6) Under capitalism freedom of choice brings maximum satisfaction to consumers.
(7) Capitalism preserves fundamental rights such as right to freedom and right to private property.
(8) It rewards men of initiative and enterprise.
(9) Country as a whole benefits through growth of business talents, development of research, etc

Demerits of Capitalism

1. There is no security of employment under capitalism.
2. In capitalism the enormous wealth produced in apportioned by a few. This causes rich, richer and poor, poorer.
3. Welfare is not protected under capitalism, because here the aim is profit and not the welfare of the people.
4. Economic instability in terms of over production, economic depression, unemployment, etc., is very common under capitalism.
5. the producer spends huge amounts of money on advertisement and sale promotion activities like fair, exhibitions, etc.
6. Class conflict arises between employer and employee. They will be paid low wages and this leads to strikes and lock-outs.
7. Productive resources are misused under capitalism. They are used for the production of luxuries as they will bring high profits.
8. 'Capitalism leads to the formation of monopolies.

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SOCIALISTIC ECONOMY

In this economy, the material means of production i.e. factories, capital, mines, etc. are owned by the whole community represented by the State. All members are entitled to get benefit from the fruits of such socialized planned production on the basis of equal rights. Some important characteristics of this economy are:

Here, production and distribution of goods are aimed at maximizing the welfare of the community as a whole. The features are as follows:

1. There is collective ownership of all means of production except small farms, workshops and trading firms which may remain in private hands. As a result of social ownership, profit-motive and self-interest are not the driving force of economic activity as it is in the case of a market economy. The resources here are used to achieve certain socio-economic objectives.
2. There is a central authority to set and accomplish socio-economic goals; that is why it is called a centrally planned economy. Major economic decisions, such as what to produce, when and how much to produce, etc., are taken by the central authority.
3. Freedom from hunger is guaranteed but consumers' sovereignty gets restricted by selective production of goods. The range of choice is limited by planned production. However, within that range an individual is free to choose what he likes most.

   The right to work is guaranteed but the choice of occupation gets restricted because these are determined by some authority on the basis of certain socio-economic goals before the nation.
4. A relative equality of income is an important feature. Among other things, differences are narrowed down by lack of opportunities to accumulate private capital. Educational and other facilities are enjoyed more or less equally; thus the basic causes of inequalities are removed.
5. Price mechanism exists in a socialist economy but it has only a secondary role, e.g., to secure disposal of accumulated stocks. Since allocation of productive resources is done according to a predetermined plan, the price mechanism as such does not influence these decisions. In the absence of the profit motive, price mechanism loses its predominant role in economic decisions. The erstwhile U.S.S.R. is an example of socialist economy. In today's world there is no country which is purely socialist.

Merits of Socialism

1. Equitable distribution of wealth and income and provision of equal opportunities for all help to maintain social justice.
2. In socialistic economy there will be better utilization of resources and it ensures the maximum production. Socialist economy means planned economy.
3. Waste of all kinds is avoided through strict economic planning.
4. In planned economy unemployment is removed, business fluctuation are eliminated and stability is brought about and maintained.
5. The absence of profit motive helps the community to develop a co-operative mentality and avoids class war.
6. Socialism ensures right to work and minimum standard of living to people.
7. Under socialisms the labourers and consumers are protected from the exploitation by the employer and monopolies respectively.

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Demerits of Socialism

1. Socialism involves the predominance of bureaucracy. Moreover, there may also be corruption, redtapism, favoritism, etc.
2. It restricts the freedom of individuals as there is state ownership of the material means of production and state direction and control of economic activity.
3. Socialism takes away such right as the right of private property.
4. It will not provide necessary incentive to hard work in the form of profit.
5. There is no proper basis for cost calculation. In the absence of such practice, the most economic and scientific allocation of resources and the efficient functioning of the economic system are impossible.
6. State monopolies created by socialism will sometime become uncontrollable. This will be more dangerous than the private monopolies under capitalism.
7. Under socialism the consumers have no freedom of choice. Therefore what state produces has to be accepted by the consumers.
8. The extreme form of socialism is not at all practicable.

NOTE : The U.S. is widely considered the bastion of capitalism, and large parts of Scandinavia and Western Europe are considered socialist democracies. However, the truth is every developed country has some programs that are socialist.

THE MIXED ECONOMY

In a mixed economy the aim is to develop a system which tries to include the best features of both the **controlled economy and the market economy** while excluding the demerits of both. It appreciates the advantages of private enterprise and private property with their emphasis on self-interest and profit motive. Vast economic development of England, the USA etc. is due to private enterprise. At the same time, it is noticed that private property, profit motive and self-interest of the market economy may not promote the interests of the community as a whole and as such the government should remove these defects of private enterprise. For this purpose, the government itself must run important and selected industries and eliminate the free play of the profit motive and self-interest. Private enterprise which has its own significance is also allowed to play the positive role in a mixed economy.

The concept of mixed economy is of recent origin. J.M. Keynes, one of the greatest economists of the 20th century favoured the idea of a mixed economy as a compromise between socialism and capitalism.

Features of a mixed economy

1. In mixed economy there is the co-existence of both private and public enterprise. In fact, in a mixed economy, there are three sectors of industries :
2. **Planned Economy:** a mixed economy is a planned economy, i.e. an economy in which the government has a clear and definite economic plan. Public sector enterprises have to work according to a plan and to achieve the objectives laid down. The government has also to

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create necessary atmosphere for the private sector to develop on its own. Thus, it must prepare plans of development for both the private and the public sector enterprises. Allocation of resources in a mixed economy should be better since it attempts to combine the productive efficiency of capitalism and distributive justice of socialism.

3. **Balanced Regional Development:** in a mixed economy balanced regional development is expected. Public sector enterprises may be located in the backward regions so as to ensure its development. Further by way of subsidies and other incentives private sector may be lured to establish and develop industries in backward regions.
4. **A Dual System of Pricing exists:** in a mixed economy, a dual system of pricing exists. In private sector, prices of goods and factors of production are determined through the free play of market forces of demand and supply. In public sector, the state determines prices of various products. The state reserves itself the right to keep different prices for public sector units and private sector units. The state may also fix the prices of certain essential commodities which are used by the common man. For example, in India, the prices of essential commodities like diesel, LPG, are fixed by government. Overall planning is done by the State Authority called Planning Commission in countries like India who have adopted mixed economy.

Merits of Mixed Economy:

1. Mixed economy secures the merits of both capitalism and socialism while avoiding the evils of both.
2. Mixed economy protects individual freedom. Under the system, individuals have the freedom of consumption, choice of occupation, freedom of enterprise and freedom of expression.
3. Price mechanism is allowed to operate under mixed economy.
4. Reducing the inequalities of wealth and class struggle is one of the aims of mixed economy.
5. Economic fluctuations can be avoided due to centrally planned economy.
6. Mixed economy helps under-developed countries to have rapid and balanced economic development.

De-merits of Mixed Economy

1. Mixed Economy is difficult to operate. Balancing and adjusting the public and private sector is often difficult.
2. Excessive controls and heavy taxes are likely to prevail under mixed economy. These will discourage production in the private sector.
3. Problems of red-tapism, nepotism, favouritism, officialdom, etc. are also found in this type of economic system.
4. Mixed economy is described by Schumpeter as "Capitalism in the oxygen tent". According to him it is only a trick of the capitalists to cheat the working class by offering them some temporary advantage like social security, uplift of the depressed classes, etc.

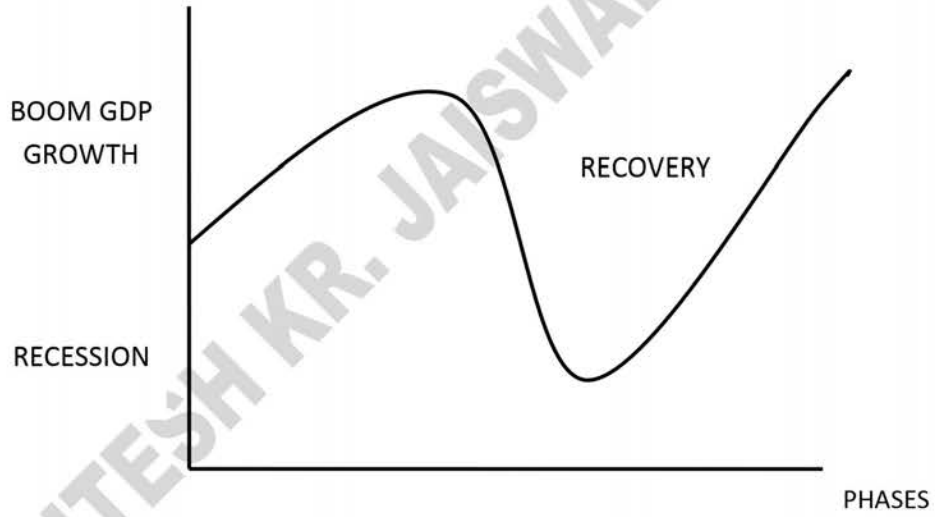
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BUSINESS CYCLE

It refers to the several ups and down the economy faces when the different parameters of the economy undergoes a change like demand and supply. This includes change in the real value of GDP. These fluctuations involve shifts over a time period of relatively rapid economic growth and periods of relatively stagnation or decline.

There are basically four different stages of economic cycle

1. **Boom** : this is the period of high growth, increased demand, increased employment opportunities and inflation, it is the best phase
2. **Slowdown :** it refers to that phase of the economy when there is deficiency of demand and supply is in excess. The rate of production slows down and therefore the employment opportunities die down.
3. **Depression** : If the above stage goes out of control and the government fails to control the situation then supply will dip further and the level income will decrease tremendously resulting in the worst phase of economic cycle.
4. **Recovery** : government will take certain fiscal and monetary policy to revive the economy and increase the demand and supply this is termed as recovery.

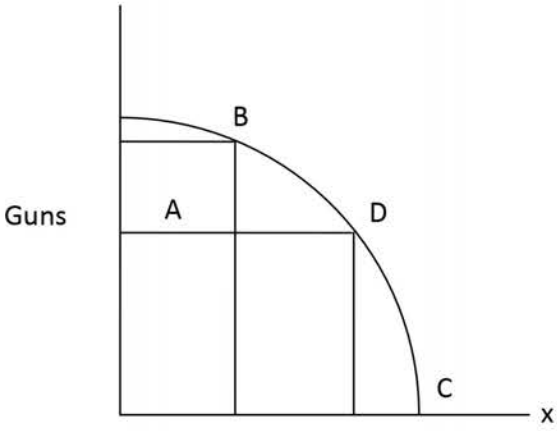


PRODUCTION POSSIBILITY CURVE

A **production–possibility frontier** (**PPF**) or **production possibility curve** (**PPC**) is a graphical representation of possible combinations of two goods (such as butter and guns) that can be produced with constant technology and resources per unit of time, such that more of one good could be produced only by diverting resources from the other good. The PPF curve shows the maximum possible production level of one commodity for any given production level of the other, given the existing state of technology. By doing so, it defines **productive efficiency**in the context of that production set: a point on the frontier indicates efficient use of the available inputs (such as points B, D and C in the graph), a point beneath the curve(such as A) indicates inefficiency, and a point beyond the curve (such as X) indicates impossibility.The combination

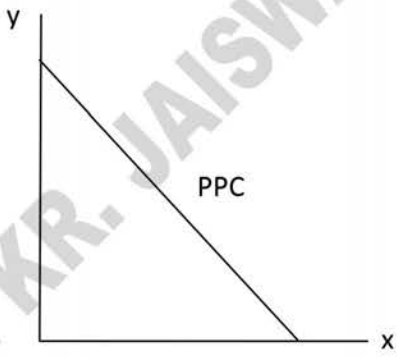
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represented by the point on the PPF where an efficient economy operates (which is obtained by tangency with the highest individual or social indifference curve, not shown in the graph) presents the priorities or choices of the modeled agent, such as the choice of having more butter produced and fewer guns, or vice versa.

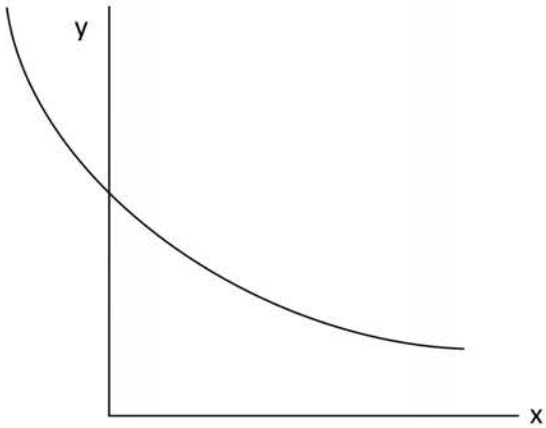


Opportunity cost is measured in the number of units of the second good forgone for one or more units of the first good.In the context of a PPF, opportunity cost is directly related to the shape of the curve (see below).

If the shape of the PPF curve is **a straight-line,**the**opportunity cost is constant**

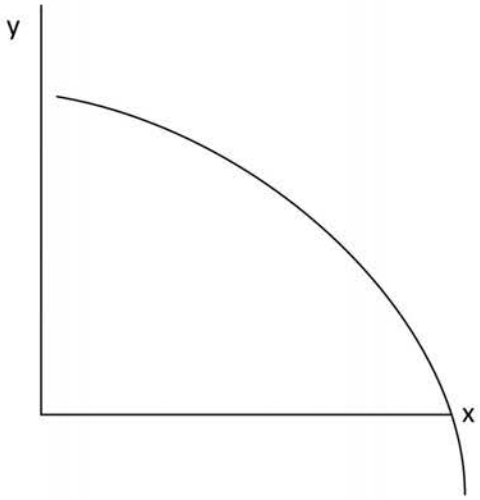


If opportunity cost is decreasing then the PPC will be convex in shape



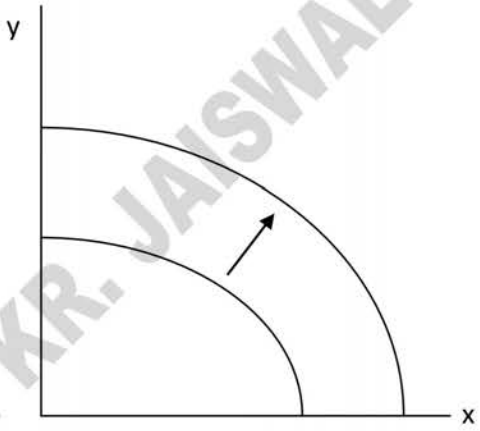
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If opportunity cost is increasing then we have a normal kindof PPC which is concave in shape

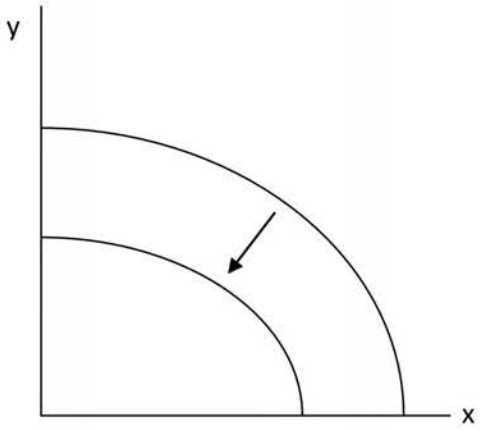


SHIFTS OF PPC

PPC shifts rightwards if there is any technological innovation or economic growth and development



PPC shifts leftwards if there is any war, disasters, flood or retardation



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SUMMARY

Study of Economics enable us to understand the logical background of the economic activities performed by us or happening in our surrounding.

– Economics is the study of choice under conditions of scarcity.

– Economics is the study of how we choose to use limited resources to obtain the maximum satisfaction of unlimited human wants.

– Adam Smith (1723 - 1790) defined Economics as- Science of wealth with an objective to increase wealth and richness of a country.

– Alfred Marshall (1842-1924) defined Economics as - "Economics examines that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well-being"

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– Lionel Charles Robbins (1898 – 1984) defined Economics as – a science which studies human behavior as a relationship between ends and scarce means which have alternative uses.

– Paul Samuelson (1915 – 2009) defined Economics as - the study of how man and society choose with or without the use of money to employ the scarce productive resources, which have alternative uses, to produce various commodities over time and distributing them for consumption, how or in the future among various person or groups in society.

– The methodology of Economics is a scientific study while the subject matter of it is of a social science. Since its assumptions are based on moral philosophy, and its measurement tools follow scientific approach, Economics as a subject stand at the intersection point of Science and Art.

– A: Positive economics is objective and fact based, while normative economics is subjective and value based. Positive economic statements do not have to be correct, but they must be able to be tested and proved or disproved.

– Normative economic statements are opinion based, so they cannot be proved or disproved.

– Microeconomics is the study of economics at an individual, group or company level.

– Macroeconomics is the study of a national economy; its income, consumption, interest rate, unemployment rate, investments, government expenditure and external economy.

– Economics is not only the study of individual choices we make, as well as their consequences. When some of the consequences are harmful, economists study what – if anything – the government can or should do about them.

– The Central Problem of the Economy are; a) what to produce? b) how to produce? and c) for whom to produce?

– The production possibility frontier (PPF) is a curve depicting all maximum output possibilities for two goods, given a set of inputs consisting of resources and other factors. The PPF assumes that all inputs are used efficiently.

– Opportunity cost is the value of
the next best choice that one gives up when making a decision.

– Capitalism is an economic system where private actors are allowed to own and control the use of property in accord with their own interests, and where the invisible hand of the pricing mechanism coordinates supply and demand in markets in a way that is automatically in the best interests of society. Government, in this perspective, is often described as responsible for peace, justice, and tolerable taxes.

– Socialism is an economic system characterized by social ownership, control of the means of production, and cooperative management of the economy. A socialist economic system would consist of anorganization of production to directly satisfy economic demands and human needs, so that goods andservices would be produced directly for use instead of for private profit driven by the accumulation of capital.

– Mixed Economy is an economic system in which both the private enterprise and a degree of state monopoly (usually in public services, defense, infrastructure, and basic industries) coexist. All modern economies are mixed where the means of production are shared between the private and public sectors.

IMPORTANT TERMS

Ends The objectives pursued by human beings while engaged in economic activities.

Means The instruments or resources used in attaining the perceived objectives.

Scarcity The imbalance between ends and means.

Laissez Faire Free market economics with a minimum of government intervention.

Economics The Word Economics Has Greek Origin. OikosPlusNomos Meaning House Management. The word economics has something to do with economizing on the use of means to attain ends out of scarce resources.

Production Possibility Curve The locus of output combinations which an economy can produce using technically most efficient methods of production and allocating resources in an economically efficient manner.

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OBJECTIVE QUESTIONS

1. 'Economics is the study of mankind in the ordinary business of life' was given by:

(a) Adam Smith
(b) Lord Robbins
(c) Alfred Marshall
(d) Samuelson

2. The branch of economics theory that deals with the problem of allocation of resources is:

(a) Micro Economics
(b) Macro Economics
(c) Econometrics
(d) None of these

3. Which one is the feature of Marshall's definition?

(a) Limited ends
(b) Scarce means
(c) Study of wealth as well as study of man
(d) Study of allocation of resources

4. Inequalities of income do not perpetuate in _____

(a) Socialism
(b) Mixed economy
(c) Capitalism
(d) None

5. If a point falls inside the production possibility curve, what does it indicate?

(a) Recourses are over utilized
(b) Resources are under utilized
(c) There is employment in the economy
(d) Both (b) and (c)

6. In which types of economy do consumers and producers make their choices based on the market forces of demand and supply?

(a) Open Economy
(b) Controlled Economy
(c) Command Economy
(d) Market Economy

7. Under a free economy, prices are:

(a) Regulated
(b) Determined through free interplay of demand and supply
(c) Partly regulated
(d) None of these

8. Which of the following falls under micro economics?

(a) National income
(b) General price level
(c) Factor pricing
(d) National saving and investment

9. In a free market economy, when consumers increase their purchase of a goods and the level of _____exceeds _____ then prices tend to rise:

(a) Demand, Supply
(b) Supply, Demand
(c) Prices, Demand
(d) Profits, Supply

10. Under Inductive method, the logic proceeds from:

(a) General to particulars
(b) Particular to general
(c) Both (a) and (b)
(d) None

11. According to Robbins, 'means' are:

(a) Scarce
(b) Unlimited
(c) Undefined
(d) All of these

12. Which of these would cause a rightward shift of the PPC curve?

(a) Improvement in technology
(b) Greater capital formation
(c) Increase in population
(d) All of these

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13. If the opportunity cost is constant, then PPC would be:

(a) Convex
(b) Straight line
(c) Backward bending
(d) Concave

14. Economics is the study of :

(a) How society manages its unlimited resources
(b) How to reduce our wants until we are satisfied
(c) How society manages its scarce resources
(d) How fully satisfy our unlimited wants

15. Mixed economy means:

(a) Co- existence is small and large industries
(b) Promoting both agriculture and industries in the economy
(c) Co- existence of rich and poor
(d) Co-existence of public and private sectors

16. Who defines economics in terms of Dynamic Growth and Development?

(a) Robbins
(b) Paul A Samuelson
(c) Adam Smith
(d) None

17. A Free Market economy solves its Central problems through_____

(a) Planning Authority
(b) Market Mechanism
(c) Both
(d) None

18. Normative aspect of Economics is given by:

(a) Marshall
(b) Robbins
(c) Adam Smith
(d) Samuelson

19. Which one is not the characteristic of capitalistic economy?

(a) Profit motive
(b) Income inequality
(c) Free employment
(d) Collective ownership

20. Mixed economy means:

(a) All economic decisions are taken by Central Authority
(b) All economics decision are taken by private entrepreneurs
(c) Economic decisions are partly taken by the state and partly by private entrepreneurs
(d) None of these

21. Capitalistic Economy uses _____ as principal means of allocating resources.

(a) Demand
(b) Supply
(c) Price
(d) All of the above

22. Economy Problem arises when:

(a) Wants are unlimited
(b) Resources are limited
(c) Alternative uses of resources
(d) All of the above

23. Micro Economics is also known as _____

(a) Public economics
(b) Price theory
(c) Income theory
(d) Demand theory

24. A developed economy uses _____ technique in production

(a) Labour intensive
(b) Capital intensive
(c) Home-based
(d) Traditional

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25. What will be the shape of PPC Curve when marginal opportunity cost is constant ?

(a) Concave
(b) Convex
(c) Backward bending
(d) Straight line

26. Which one is the feature of Marshall's definition?

(a) Limited ends
(b) Scarce means
(c) Study of wealth as well as study of man
(d) Study of allocation of resources

27. Which one in the following is not correct:

(a) There are limited wants
(b) Means are scarce
(c) Resources have alternative uses
(d) Economics is science

28. Micro Economics is concerned with :

(a) Consumer Behaviour
(b) Product pricing
(c) Factor Pricing
(d) All of the above

29. Who gave the positive aspect of science?

(a) Alfred Marshall
(b) A.C Pigou
(c) Adam smith
(d) Robbins

30. Mixed economy means:

(a) Coexistence of both private and public sector
(b) Coexistence of poor and rich people
(c) Both (a) and (b)
(d) None

31. Which of these is a part of micro economics?

(a) Factor pricing
(b) National income
(c) Balance of payment
(d) None

32. Which of these is an example of macroeconomics:

(a) Problem of unemployment in India
(b) Rising price level in the country
(c) Increase in disparities of income
(d) All of above

33. In a capitalist economy the allocation of resources performed by:

(a) Producers
(b) Government
(c) Planners
(d) Price mechanism

34. Which of the following statements is incorrect?

(a) Alfred marshall propagated the wealth definition of Economics
(b) L. Robbins introduced the "Scarcity" definition of Economics
(c) Samuelson emphasized upon the "growth" aspect of Economics
(d) A.C Pigou believed in "welfare" aspect of Economics

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ANSWERS

1	(c)	**2**	(a)	**3**	(c)	**4**	(a)	**5**	(b)	**6**	(d)	**7**	(b)
8	(c	**9**	(a)	**10**	(b)	**11**	(a)	**12**	(a)	**13**	(b)	**14**	(c)
15	(d)	**16**	(b)	**17**	(b)	**18**	(a)	**19**	(d)	**20**	(c)	**21**	(c)
22	(d)	**23**	(b)	**24**	(b)	**25**	(d)	**26**	(c)	**27**	(d)	**28**	(d)
29	(d)	**30**	(a)	**31**	(a)	**32**	(d)	**33**	(d)	**34**	(a)		

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CHAPTER 2 DEMAND & SUPPLY

CONCEPT OF DEMAND

Ordinarily, the terms, desire and demand are used interchangeably. But in economics, demand has a distinct meaning supposing, you desire to have a colour TV, but you do not have enough money to buy it. Than, this desire will remain just a wishful thinking; it will not be called demand. And, if in spite of having enough money, you do not want to spend it on colour TV, demand does not emerge. The desire becomes demand only when you are to spend money to buy TV. Thus, demand for a commodity refers to the desire to buy a commodity backed with sufficient purchasing power and the willingness to spend.

Definition of Demand

"Demand refers the amount of a commodity which a buyer is willing to buy in a market at the given price of the commodity or at the given price of related commodities or at the given income of consumers over a given time period".

Demand Schedule

Demand Schedule is that Schedule which expresses the relation between different quantities of the commodity demanded at different prices. According to Samuelson, "The table relating to price and quantity demanded is called the demand Schedule".

Individual Demand Schedule is a table showing different quantities of a commodity that one particular buyer in the market is ready to buy at different possible prices of the commodity at a point of time.

Following table indicates the different quantities of ice cream to be bought by a consumer at different prices, at a given time.

Individual Demand Schedule

Price of Ice cream (₹)	Quantity Demanded (Units)
1	4
2	3
3	2
4	1

As the price of ice cream increases, quantity demanded tends to decrease.

When price is ₹4 per cup, then the consumer demands one cup; when price falls to Re 1 per cup, the demand increase to 4 cups.

Market demand schedule is a table showing different quantities of a commodity that all the buyers in the market are ready to buy at different possible prices of the commodity at a point of time.

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On the assumption that there are only 2 buyers in the market, market demand schedule for ice cream may be drawn as under:

Price of Ice cream (₹)	A's Demand (1)	B's Demand (2)	Market Demand (3)(1+2)
1	4	5	4+5=9
2	3	4	3+4=7
3	2	3	2+3=5
4	1	2	1+2=3

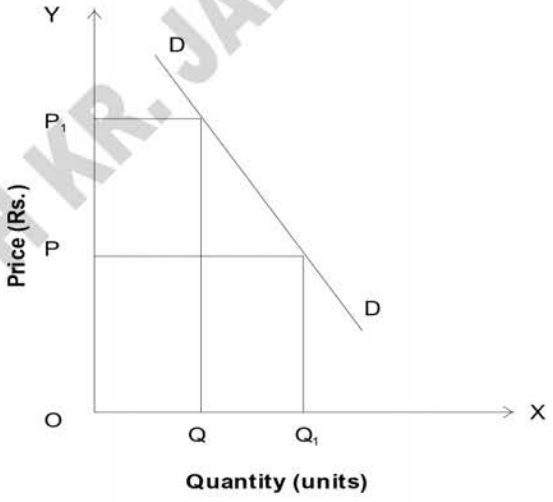
When price is Re 1 then A's demand is for 4 ice cream cups and B's demand is for 5 ice cream cups. Thus, the total market demand at Re 1 is 9 cups of cream. But when price rises to Re 2 per cup then market demand falls to 7 ice cream cups.

DEMAND CURVE

Demand curve is simply a graphic representation of demand schedule expressing the relationship between different quantities demanded at different possible prices of a commodity demand curve is two types:

Individual Demand Curve

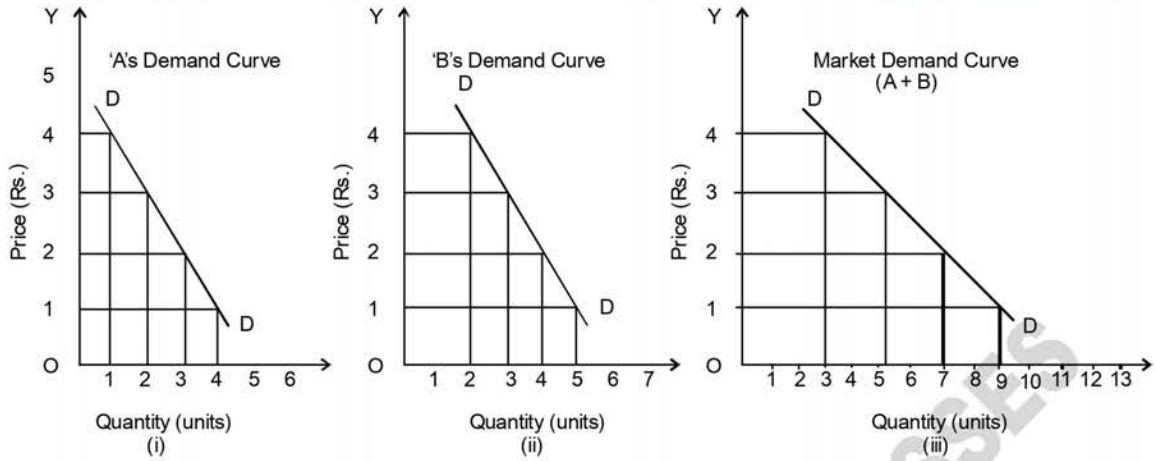
Individual Demand Curve is a curve showing different quantities of a commodity that one particular buyer is ready to buy at different possible prices of the commodity at a point of time. In the following diagram quantity of the commodity is shown on OX-axis price on OY-axis. DD is the demand curve.



Market Demand Curve

Market Demand Curve is the **horizontal summation** of the individual demand curves. It various quantities of a commodity that all the buyers in the market are ready to buy at different possible prices of the commodity at a point of time.

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A and B are two buyers in the market. Fig. (i) Is A's demand curve. Fig. (ii) Is B's demand curve. Fig. (iii) Is the market demand curve. When price is Re 1 per ice cream cup, A's demand is 4 cup and B's demand is for 5 cups. Accordingly, market demand is 4+5=9 cups when the price is Re 1 per cup. Likewise, when price is ₹4 per cup, market demand is 1+2=3 cups. Market demand curve also slopes downward. Slope indicating inverse relationship between price of the commodity and its quantity demanded.

FACTORS AFFECTING DEMAND

The law of demand, while explaining the price-demand relationship assumes other factors to be constant. In reality however, these factors such as income, population, tastes, habits, preferences etc., do not remain constant and keep on affecting the demand. As a result the demand changes i.e. rises or falls, without any change in price.

1. **Income**: The relationship between income and the demand is a direct one. It means the demand changes in the same direction as the income. An increase in income leads to rise in demand and vice versa.
2. **Population**: The size of population also affects the demand. The relationship is a direct one. The higher the size of population, the higher is the demand and vice versa.
3. **Tastes and Habits**: The tastes, habits, likes, dislikes, prejudices and preference etc. of the consumer have a profound effect on the demand for a commodity. If a consumer dislikes a commodity, he will not buy it despite a fall in price. On the other hand a very high price also may not stop him from buying a good if he likes it very much.
4. **Price of other related goods**: This is another important determinant of demand for a commodity. The effect depends upon the relationship between the commodities in question. If the price of a complimentary commodity rises, the demand for the commodity in reference falls. E.g. the demand for petrol will decline due to rise in the price of cars and the consequent decline in their demand. Opposite effect will be experienced incase of substitutes

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5. **Advertisement**: This factor has gained tremendous importance in the modern days. When a product is aggressively advertised through all the possible media, the consumers buy the advertised commodity even at a high price and many times even if they don't need it.
6. **Fashions**: Hardly anyone has the courage and the desire to go against the prevailing fashions as well as social customs and the traditions. This factor has a great impact on the demand.
7. **Imitation**: This tendency is commonly experienced everywhere. This is known as the demonstration effects, due to which the low income groups imitate the consumption patterns of the rich ones. This operates even at international levels when the poor countries try to copy the consumption patterns of rich countries.
8. **Price of the commodity:** demand of a commodity is inversely proportional to the price of commodity. Price of the commodity increase, then the demand decreases and vice-versa.
9. **Distribution of Income:** Market demand is also influenced by change in the distribution of income in the society. If income is equally distributed, there will be more demand. If income is not equally distributed, there will be less demand. In case of unequal distribution, most people will not have enough money to buy things.

LAW OF DEMAND

This law explains the functional relationship between price of a commodity and the quantity demanded of the same. It is observed that the price and the demand are inversely related which means that the two move in the opposite direction. An increase in the price leads to a fall in the demand and vice versa. This relationship can be stated as

"Other things being equal, the demand for a commodity varies inversely as the price"

Assumptions of the 'Law of Demand'

The law of demand in order to establish the price-demand relationship makes a number of assumptions as follows:

1. Income of the consumer is given and constant.
2. No change in tastes, preference, habits etc.
3. Constancy of the price of other goods.
4. No change in the size and composition of population.

These Assumptions are expressed in the phrase **"other things remaining equal"**.

Explanation

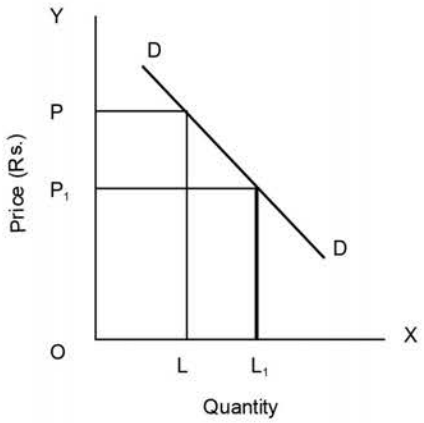
Law of demand may be explained with the help of demand schedule:

Demand Schedule

P_x (₹)	Q_x (₹)
10	100
9	150
8	200

The schedule shows extension of demand in response to decrease in price of the commodity. Thus, demand stretches from 100 to 150 units when price reduces from ₹10 to ₹9 per unit. It may be further illustrated with the help of a demand curve.

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In the above diagram, demand curve DD shown that demand for commodity-X extends from OL to OL_1 when price falls from OP to OP_1. In fact, downward slope of demand curve is an expression of the law of demand.

WHY DOES DEMAND CURVE SLOPE DOWNWARDS

Downward slope of demand curve indicates that more is purchased in response to fall in price. Thus, there is inverse relationship between price of a commodity and its quantity demanded. This may be explained in terms of the following factors:

1. **Law of Diminishing Marginal Utility:** According to this Law, as consumption of a commodity increases, the utility from each successive unit goes on diminishing to a consumer. Accordingly, for every additional unit to be purchased, the consumer is willing to pay less and less price. Thus, more is purchased only when price of the commodity falls.
2. **Income Effects:** Income effect refers to change in quantity demanded when real income of the buyers changes as a result of change in price of the commodity. Change in the price of a commodity causes a change in real income of the consumer. With a fall in price, real income increase. Accordingly, demand for the commodity expands.
3. **Substitution Effect:** Substitution effect to substitution of one commodity for the other when it becomes relatively cheaper. Thus, when price of commodity-X falls, it becomes cheaper in relation to commodity-Y. Accordingly, X is substituted for Y. Tea and Coffee are substitutes. With a fall in the price of tea, it is substituted for coffee. It is called substitution effect.
4. **Size of Consumer Group:** When price of a commodity falls, it attracts new buyers who now can afford to buy it.
5. **Different Users:** Many goods have alternative uses. Milk, for example, is reduces its uses will expand. Accordingly, demand for milk expands.

Income Effect and Substitution Effect

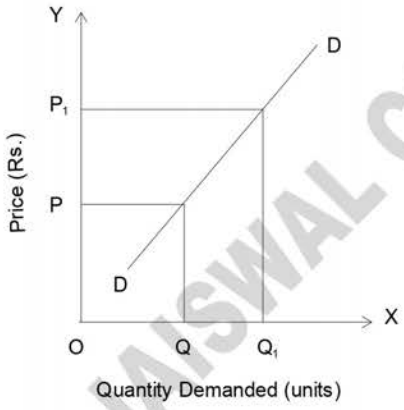
The term "effect" is used to denote the change in demand for a good under consideration. Income effect on X measures the change in Dx, the demand for X on account of a change in the income of the consumer. Similarly, if price of X changes relative to the price of its substitutes

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good Y (that is, if X becomes comparatively cheaper or costlier than Y), while real income of the consumer remains same, then the resultant change in its demand is termed substitution effect.
It is noteworthy that income effect need not be positive, that is, demand for X need not change in the same direction as the income of the consumer. In case of 'inferior' good, the income effect is negative. If negative effect is stronger than the substitution effect, then their summation, that is, the price effect will also be negative and the result will be a reduction in the demand for X.

EXCEEPTIONS TO THE LAW OF DEMAND

Law of demand has some exceptions as well. There are some commodities whose demand increases when their price rises and decrease when their price falls. In this case, the demands curve DD slopes upwards from left to right as shown in following diagram. It means a positive slope. First of all, this fact was analyzed by Sir Robert Giffen. So, it is also called **Giffen's Paradox**.



The main causes of the demand curve being exceptional are as under:

1. **Expected change in the price of a good:** Continuous changes in the price lead to the exceptional behavior. If the price shows a rising trend a buyer is likely to buy more at a high price for protecting himself against a further rise. As against it when the price starts falling continuously, a consumer buys less at a low price and awaits a further in price
2. **Giffen Goods:** Giffen goods may be defined as those goods whose price effect is **positive** and income effect is **negative**. Positive price effect means that demand falls with a fall in price and rises with a rise in price. The positive relationship between price and demand (in case of Giffen goods) occurs because of a very high negative income effect. The Giffen goods are highly inferior goods, showing a very high negative income effect. As a result, when price of such commodities falls, their demand also falls.
3. **Articles of distinction:** Conspicuous Consumption refers to the consumption of those commodities which are bought as a matter of prestige. Naturally with a fall in the price of such goods, there is no distinction in buying the same. As a result the demand declines with a fall in the price of such prestige goods.
4. **Ignorance: Ignorance** effect implies a situation in which a consumer buys more of a commodity at a higher price only due to ignorance.

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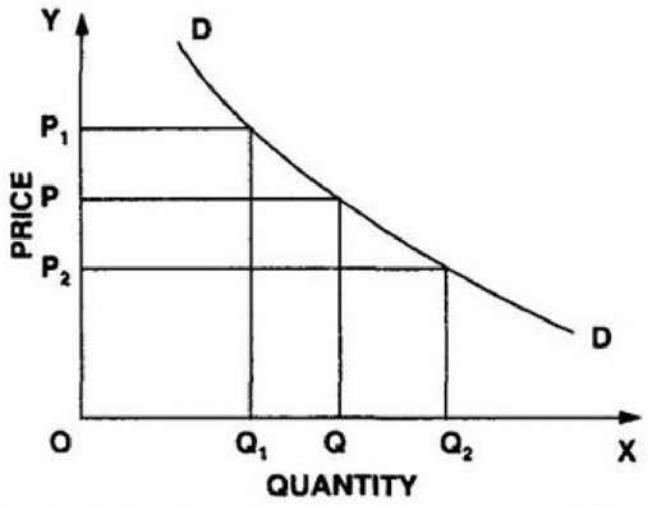
5. **Demonstration Effect:** Consumers are influenced in their decisions by what is known as a demonstration effect. Demand for certain goods goes up when people want to buy them because their neighbours have them. Due to growing popularity, the demand for such goods goes up even when their prices increase.
6. **Complementary Good:** Law of demand may be violated in the case of complementary goods also. If price of one of these goods falls sufficiently, the consumers would buy more it. And this will necessitate that the consumer should have more of the other good as well. As a result, its demand goes up without a fall in its price. Actually, in some cases its demand may increase even with some increase in its price

VARIATION & CHANGES IN DEMAND

The law of demand explains the effect of only-one factor viz., price, on the demand for a commodity, under the assumption of constancy of other determinants. In practice, other factors such as, income, population etc. cause the rise or fall in demand without any change in the price. These effects are different from the law of demand. They are termed as changes in demand in contrast to variations in demand which occur due to changes in the price of a commodity. In economic theory a distinction is made between (a) Variations i.e. extension and contraction in demand due to price and (b) Changes i.e. increase and decrease in demand due to other factors.

(a) Variations in demand refer to those which occur due to changes in the price of a commodity.

1. **Extension of Demand**: This refers to rise in demand due to a fall in price of the commodity. It is shown by a downwards movement on a given demand curve.
2. **Contraction of Demand**: This means fall in demand due to increase in price and can be shown by an upwards movement on a given demand curve.



2.3 (A) Extension/Contraction of Demand

EXTENSION / CONTRACTION OF DEMAND

(b) Changes in demand imply the rise and fall due to factors other than price.

It means they occur without any change in price. They are of two types.

1. **Increase in Demand**: This refers to higher demand at the same price and results from rise in income, population etc., this is shown on a new demand curve lying above the original one.
2. **Decrease in demand**: It means less quantity demanded at the same price. This is the result of factors like fall in income, population etc. this is shown on a new demand lying below the original one.

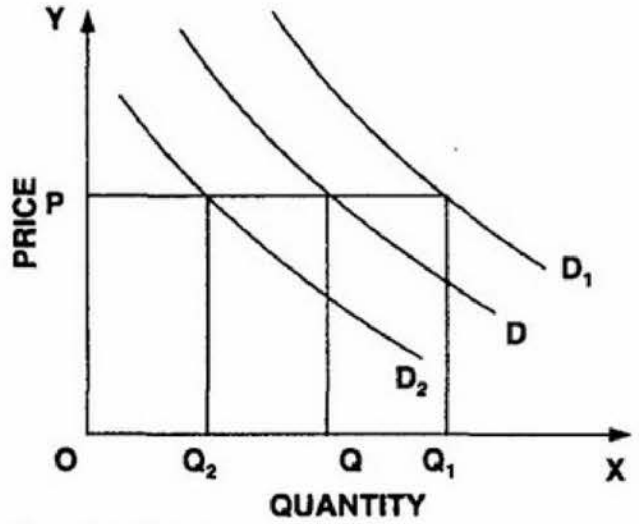


Fig. 2.3 (B) Increase/Decrease in Demand

INCREASE / DECREASE IN DEMAND

In figure A, the original price is OP and the Quantity demanded is O With a rise in price from OP to OP1 the demand contracts from OQ to OQ1 and as a result of fall in price from OP to OP2, the demand extends from OQ to OQ2.

In figure, B an increase in demand is shown by a new demand curve, D1 while the decrease in demand is expressed by the new demand curve D2, lying above and below the original demand curve D respectively. On D1 more is demand (OQ1) at the same price while on D2 less is demanded (OQ2) at the same price OP.

ELASTICITY OF DEMAND

The law of demand explains the direction of a change as it states that with a rise in price the demand contracts and with a fall in price it expands. **The law of demand explains the qualitative but not the quantitative aspect of price- demand relationship.**

The concept of the elasticity of demand has great significance as it explains the **degree of responsiveness of demand to a change in price.**

Different commodities react to a change in price in the same direction; the degree of their response differs. Elasticity of demand is a measure of relative changes in the amount demanded in response to a small change in price. Certain goods are said to have an elastic demand while others have an inelastic demand. The demand is said to be elastic when a small change in price brings about considerable change in demand. On the other hand, the demand for a good is said to be inelastic when a change in price fails to bring about significant change in demand.

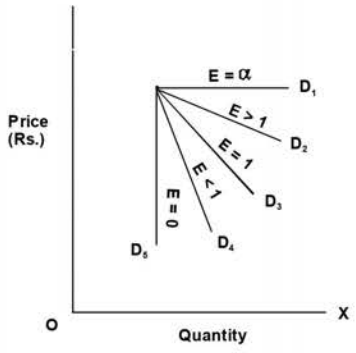
Elasticity is defined as the responsiveness of the quantity demanded of a good to change in one of the variables on which demand depends.

Ed = [Percentage change in quantity demanded / Percentage change in the price]

TYPES OF PRICE ELASTICITY

1. **Perfectly inelastic demand (Ed = 0)**
   This describes a situation in which demand shows no response to a change in price.
   The vertical straight line demand curve as shown alongside reveals that with a change in price the demand remains same. Thus, demand does not at all respond to a change in price. Thus Ed = O.
2. **Inelastic (less elastic) demand (Ed < 1)**
   In this case the proportionate change in demand is smaller than in price.
3. **Unitary elasticity demand (e = 1)**
   When the percentage change in price produces equivalent percentage change in demand, we have a case of unit elasticity.
4. **Elastic (more elastic) demand (e > 1)**
   In case of certain commodities the demand is relatively more responsive to the change in price. It means a small change in price induces a significant change in, demand.
5. **Perfectly elastic demand (e = ∞)**
   This is experienced when the demand is extremely sensitive to the changes in price. In this case an insignificant change in price produces tremendous change in demand. The demand curve showing perfectly elastic demand is a horizontal straight line.

   It can be noticed that at a given price an infinite quantity is demanded. A small change in price produces infinite change in demand. A perfectly competitive firm faces this type of demand.



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From the above analysis it can be concluded that theoretically five different types of price elasticity can be mentioned. In practice, however two extreme cases i.e. perfectly elastic and perfectly inelastic demand, are rarely experienced. What we really have is more elastic (e > 1) or less elastic (e < 1) demand. The unitary elasticity is a dividing line between these two cases.

MEASUREMENT OF ELASTICITY

1. **Percentage Method**: In this method, the percentage change in demand and percentage change in price are compared.

   Symbolically:

   Ed = [Percentage change in demand / Percentage change in price]

   % change in the quantity demanded = q1 – q/q x 100

   = dq/q x100

   Where, q1 is quantity demanded after change in the price

   q is the quantity demanded at the original price

   % change in the price can be presented as P1-P/Px100

   = dp/px100

   Where,

   P1 is the change in price and

   P is the original price

   $$Ed = \frac{\frac{\Delta q}{q} \times 100}{\frac{\Delta P}{P} \times 100}$$

   $$= \frac{\frac{\Delta q}{q}}{\frac{\Delta P}{P}}$$

   $$= \frac{\Delta q}{q} \times \frac{P}{\Delta P} \quad = \frac{\Delta q}{\Delta P} \times \frac{P}{q}$$

   Where, Δ q = Proportionate change in quantity demanded.

   Δ P = Proportionate change in price.

   P = Original Price.

   Q = Original quantity demanded.

   E_d, Elasticity of demand is also known as elasticity co-efficient and the value of elasticity co-efficient varies between zero to infinity or $0 \leq E_d \leq \infty$

   In this method, three values of 'e' can be obtained. Viz., e = 1, e > 1, e < 1.

2. **Total Outlay Method**: The elasticity of demand can be measured by considering the changes in price and the consequent changes in demand causing changes in the total amount spent on the goods. The change in price changes the demand for a commodity which in turn changes the total expenditure of the consumer or total revenue of the seller.

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TQ = P x Q

Where TQ = Total Expenditure; P = price; Q = Quantity purchased

1. If a given change in price fails to bring about any change in the total outlay, it is the case of unit elasticity. It means if the total revenue (price x Quantity bought) remains the same in spite of a change in price, 'e' is said to be equal to 1.
2. If price and total revenue are inversely related, i.e., if total revenue falls with rise in price or rises with fall in price, demand is said to be elastic or e > 1.
3. When price and total revenue are directly related, i.e. if total revenue rises with a rise in price and falls with a fall in price, the demand is said to be inelastic e < 1.

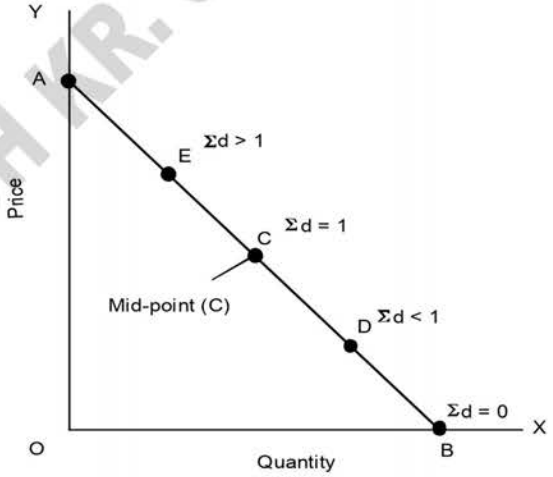
Price	Total Expenditure	Elasticity of Demand
Increase	Increases	Less than 1
Increases	Remains Same	Equal to 1
Increases	Falls	More than 1
Falls	Falls	Less than 1
Falls	Remains Same	Equal to 1
Falls	Increases	More than 1

3. Point Elasticity of Demand

A diagrammatic method of measuring elasticity of demand enables us to be measure it by referring to a single point on the demand curve and is therefore is termed 'point method' of measuring elasticity.

This method is used to calculate E_d at a particular point of demand curve.

$$E_d = \frac{\text{Lowersectoroftthedemandcurve}}{\text{Uppersectoroftthedemandcurve}}$$



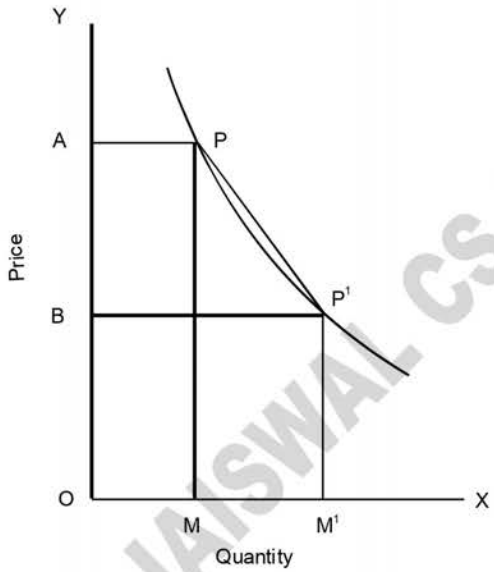
1. If lower sector = Upper sector, then $E_d = 1$
2. If LS > US, then $E_d > 1$
3. If LS < US, then $E_d < 1$
4. If LS = 0, then E_d will be 0
5. If US = 0, then E_d will be ∞

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4. **Arc Method:**

From a practical point of view, this method is highly useful in measuring elasticity of demand. We take the initial and changed values of price and the corresponding initial and resultant quantities of demand and use them to estimate the elasticity of demand by the following formula:

$$ep = \frac{\Delta q}{\Delta P} \times \frac{\frac{P + P1}{2}}{\frac{q + q1}{2}} or \frac{\Delta q}{\Delta P} \times \frac{P + P1}{q + q1}$$



It should be noted that arc elasticity is an average of all the elasticity associated with the range of price between PM and P₹ M₹

DETERMINANTS OF ELASTICITY OF DEMAND

1. **Nature of the Commodity**: Humans wants, i.e. the commodities satisfying them can be classified broadly into necessaries on the one hand and comforts and luxuries on the other hand. The nature of demand for a commodity depends upon this classification. The demand for necessities is inelastic and for comforts and luxuries it is elastic.
2. **Number of Substitutes Available**: The availability of substitutes is a major determinant of the elasticity of demand. The large the number of substitutes, the higher is the elastic. It means if a commodity has many substitutes, the demand will be elastic. As against this in the absence of substitutes, the demand becomes relatively inelastic because the consumers have no other alternative but to buy the same product irrespective of whether the price rises or falls.
3. **Number of Uses**: If a commodity can be put to a variety of uses, the demand will be more elastic. When the price of such commodity rises, its consumption will be restricted only to more important uses and when the price falls the consumption may be extended to less urgent uses, e.g. coal electricity, water etc.

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4. **Possibility of Postponement of Consumption**: This factor also greatly influences the nature of demand for a commodity. If the consumption of a commodity can be postponed, the demand will be elastic.
5. **Range of prices**: The demand for very low-priced as well as very high-price commodity is generally inelastic. When the price is very high, the commodity is consumed only by the rich people. A rise or fall in the price will not have significant effect in the demand. Similarly, when the price is so low that the commodity can be brought by all those who wish to buy, a change, i.e., a rise or fall in the price, will hardly have any effect on the demand.
6. **Proportion of Income Spent**: Income of the consumer significantly influences the nature of demand. If only a small fraction of income is being spent on a particular commodity, say newspaper, the demand will tend to be inelastic.
7. **Consumer habits**: If a household is habitual of consuming the commodity no matter how much the increase in price is, the demand for the commodity will be inelastic. Buyer's intense preference for a commodity makes its demand inelastic.
8. **Income of consumer**: People whose income is Very high or very low, their demand will ordinarily be inelastic. Because rise or fall in price will have little effect on their demand. Conversely, middle income groups will have elastic demand.
9. **Time Period**: Demand is inelastic in short period but elastic in long period. It is so because in the long period, a consumer can change his habits more conveniently than in the short period.

IMPORTANCE OF ELASTICITY OF DEMAND

The concept of elasticity is of great importance both in economic theory and in practice.

1. Theoretically, its importance lies in the fact that it deeply analyses the price-demand relationship. The law of demand merely explains the qualitative relationship while the concept of elasticity of demand analyses the quantitative price-demand relationship.
2. The Pricing policy of the producer is greatly influenced by the nature of demand for his product. If the demand is inelastic, he will be benefited by charging a high price. If on the other hand, the demand is elastic, low price will be advantageous to the producer. The concept of elasticity helps the monopolist while practicing the price discrimination.
3. The price of joint products can be fixed on the basis of elasticity of demand. In case of such joint products, such as wool and mutton, cotton and cotton seeds, separate costs of production are not known. High price is charged for a product having inelastic demand (say cotton) and low price for its joint product having elastic demand (say cotton seeds).
4. The concept of elasticity of demand is helpful to the Government in fixing the prices of public utilities.
5. The Elasticity of demand is important not only in pricing the commodities but also in fixing the price of labour viz., wages.
6. The concept of elasticity of demand is useful to Government in formulation of economic policy in various fields such as taxation, international trade etc. (a) The concept of elasticity

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of demand guides the finance minister in imposing the commodity taxes. He should tax such commodities which have inelastic demand so that the Government can raise handsome revenue.(b) The concept of elasticity of demand helps the Government in formulating commercial policy. Protection and subsidy is granted to the industries which face an elastic demand.

7. The concept of elasticity of demand is very important in the field of international trade. It helps in solving some of the problems of international trade such as gains from trade; balance of payments etc. policy of tariff also depends upon the nature of demand for a commodity.

INCOME ELASTICITY OF DEMAND

The income elasticity of demand explains the extent of change in demand as a result of change in income. In other words, income elasticity of demand means the responsiveness of demand to changes in income. Thus, income elasticity of demand can be expressed as:
Ey = [Percentage change in demand / Percentage change in income]

The following types of income elasticity can be observed:

1. **Income Elasticity of Demand Greater than One**: When the percentage change in demand is greater than the percentage change in income, a greater portion of income is being spent on a commodity with an increase in income- income elasticity is said to be greater than one.
2. **Income Elasticity is unitary:** When the proportion of income spent on a commodity remains the same or when the percentage change in income is equal to the percentage change in demand, Ey = 1 or the income elasticity is unitary.
3. **Income Elasticity Less Than One (Ey< 1):** This occurs when the percentage change in demand is less than the percentage change in income.
4. **Zero Income Elasticity of Demand (Ey=o):** This is the case when change in income of the consumer does not bring about any change in the demand for a commodity.
5. **Negative Income Elasticity of Demand (Ey< o):** It is well known that income effect for most of the commodities is positive. But in case of inferior goods, the income effect beyond a certain level of income becomes negative. This implies that as the income increases the consumer, instead of buying more of a commodity, buys less and switches on to a superior commodity. The income elasticity of demand in such cases will be negative.

CROSS ELASTICITY OF DEMAND

The concept of cross elasticity explains the degree of change in demand for X as a result of change in price of Y. This can be expressed as:
Ec = [Percentage Change in demand for X / Percentage change in price of Y]
The relationship between any two goods is of two types. The goods X and Y can be complementary goods (such as pen and ink) or substitutes (such as pen and ball pen).
In case of complementary commodities, the cross elasticity will be negative. This means that fall in price of X (pen) leads to rise in its demand so also rise in demand for Y (ink)

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On the other hand, the cross elasticity for substitutes is positive which means a fall in price of X (pen) results in rise in demand for X and fall in demand for Y (ball pen).

If two commodities, say X and Y, are unrelated there will be no change in Demand for X as a result of change in price of Y. Cross elasticity in case of such unrelated goods will then be zero.

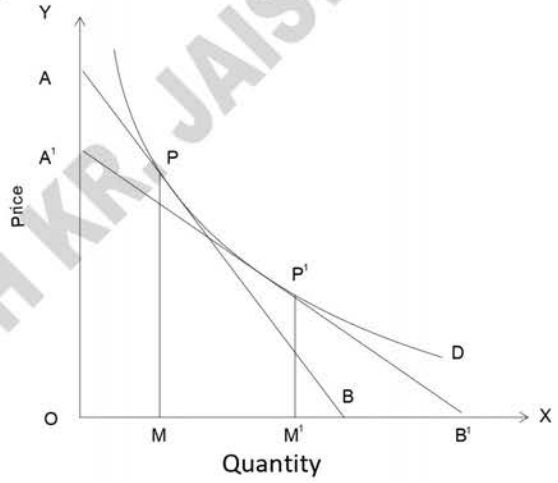
In short, cross elasticity will be of three types:

1. Negative cross elasticity – Complementary commodities.
2. Positive cross elasticity – Substitutes.
3. Zero cross elasticity – Unrelated goods.

In nutshell, it can be concluded that the concept of elasticity of demand has great significance in economic analysis. Its usefulness in branches of economic such as production, distribution, public finance, international trade etc., has been widely accepted.

METHOD FOR MEASURING POINT ELASTICITY ON A NON – LINEAR DEMAND CURVE

When demand curve is curvilinear instead of a straight line, and we want to measure elasticity of demand at a point P on it, we should draw a tangent to it at point P, consider as if the tangent is the demand curve, and use the same approach as before in measuring elasticity of demand. Thus, in the following diagram, elasticity of demand at point P equal PB/AP =BM/OM, while at point P' it is P'B'/ A'P=B'M'/OM'.



It is important to note that whether demand curve is a straight line or is curvilinear, in both cases elasticity of demand varies from point to point along the demand curve. This is explained as follows.

We have seen that elasticity of demand is the product of two terms, namely, (i) the slope of demand curve at point P, (Δ D/ Δ P) and (ii) the ratio of original price to original demand, (P/D). In the case of a straight line demand curve the first term, namely, (Δ D/ Δ P) remain unchanged, but the second term (P/D) varies as we move along the demand curve.

As we move along the curvilinear demand curve from left to right, the slope of tangent falls is (Δ D/ Δ P) decrease. AT the same time, in the ratio P/D, the numerator falls and denominator increases.

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SUPPLY ANALYSIS

SUPPLY

Supply means the amount of a good or service that the producers are willing and able to offer to the market at various prices during a period of time.

Supply and Quantity supply:

Quantity supplied refers to a specific quantity of a commodity that the producers are ready to sell at a specific price of the commodity. Supply on the other hand, refers to various quantities offered for sale at different possible prices of the commodity.

Difference between supply and stock:

Stock of commodity is the total quantity that is available in a market at a certain time while supply is that part of stock which a seller is ready to sell at a certain price during a certain time. Thus supply is part of stock which is actually brought into the market.

Supply function or determinants of supply Function

Supply function established relationship between supply of commodity and various factors affecting it.

$$S_x = f(P_x, E_x, P_o, P_f, T, G, N_f, G_p, F_e, U)$$

Where,

S_x = Supply of commodity
f = Functional relationship
P_x = Price of the commodity
E_x = Expected future price
P_o = Price of other related commodity
P_f = Price of factors of production
T = States of the technology
G = Goal of a business firm
N_f = No. of firms in the industry
G_p= Government policy
F_e = Change in producer or seller expectation
U = Other Factors

i. Price of the goods: Other things being equal, the higher the relative price of a good the greater the quantity of it that will be supplied. This is because goods and service are produced by the firm in order to earn profits and, certain paribus; profits rise if the price of its product rises.

ii. Expected future price: If the producer expects price of the commodity to raise in the near future, current supply of the commodity will reduce. If, on the other hand, fall in the price is expected, current supply will increase.

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iii. Price of the related goods: If the prices of other goods rise, they become relatively more profitable to the firm to produce and sell than the good in question. It implies that if the price of y rises, the quantity supplied of X will fall. For example, if price of wheat rises, the farmers may shift lands to wheat production and way from corn and soybeans.

iv. Price of the factors of production: A rise in the price of particular factor of production will cause an increase in the cost of making those goods that use a great deal of that factor than in the costs of producing those that use relatively small amount of the factor. For example, a rise in the cost of land will have a large effect on the cost of producing wheat and a very small effect on the cost producing automobiles. Thus a change in the price of one factor of production will cause changes in the relative profitability of different lines of production and will cause's producers to shift from one line to another and thus supplies of different commodities will change.

v. State of technology: The supply of a particular product depends upon the state of technology also. Inventions and innovations tend to make it possible to product more of=r better goods with the same resources, and thus they tend to increase the quantity supplied of some products and to reduce the quantity supplied of products that are displaced.

vi. Government Policy: The production of a good may be subject to the imposition of commodity taxes such as excise duty, sales tax and import duties. These raise the cost of production and so the quantity supplied of a good would increase only when its, price in the market rises. Subsidies, on the other hand, deduct the cost of production and thus provide an incentive to the firm to increase supply.

vii. Change in the number of firms in the industry (market); a change in number of firm in the industry as a result of profitability also influence the market supply of a good. For example, an increase in number of firms in the industry attracted by higher profit would increase the quantity supplied of good over the range of prices. On the other hand, a reduction in number would the market supply.

viii. Government policy towards taxing or subsiding the production of the good or service: A change in government fiscal policy in terms of change in tax rate or amount of subsidy may influence the supply of a good in the market. A decrease / increase in the amount of tax on the good or service or an increase / decrease in the government subsidy on a good would allow firms to offer more / less amount of a good at a given range of prices.

ix. Change in Producer or Seller Expectations: The supply curve like the demand curve is drawn for a certain time period. If the expectations of the future prices drastically in a market – for example, prices of goods and services expected to rise suddenly, the firm would hold current production from the market in anticipation of higher prices and thus influences supply of good.

x. Other Factors: The quantity supplied of a good also depends upon government's industrial and foreign policies, goals of the firm, infrastructural facilities, market structure, natural factors etc.

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SUPPLY SCHEDULE

Supply Schedule is a tabular statement showing the different quantity of a commodity that is offered in market for sale at different possible prices at a given period of time. Supply schedule may be two types:

(i) Individual supply schedule
(ii) Market Supply Schedule

(i) Individual supply schedule:

It is a tabular presentation of the quantity of a commodity that an individual producer or seller is ready to sell at different prices.
Individual supply schedule.

Price of commodity	Quantity supplied
1o	1000
8	700
6	500
4	300

(ii) Market Supply Schedule:

The market supply schedule is a tabular presentation of data which show the total quantities of a product which all its producers jointly ready for sale at different prices.

	Quantity Supply			
Price of Goods	Firm A	Firm B	Firm C	Total Supply in The market
2	50	100	150	300
4	150	200	250	600
5	200	250	300	750
6	250	300	350	900

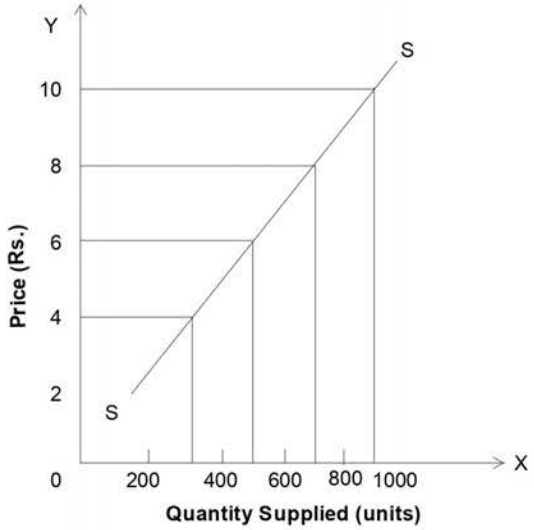
SUPPLY CURVE:

Supply curve is a graphic presentation of supply schedule, indicating positive relationship between price of a commodity and its quantity supplied. It has two aspects:
(i) Individual supply curve
(ii) Market supply curve

(i) Individual supply curve

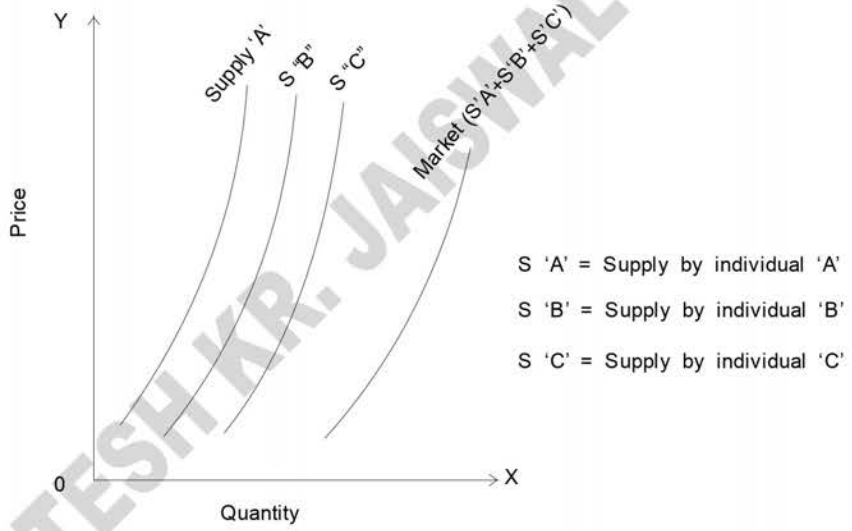
It is a graphic presentation of supply schedule of an individual firm in the market. In the following diagram, Supply curve (SS) slopes upward. It shows that more of the commodity is supplied at high price.

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(ii) Market supply curve:

Market supply curve is a graphic presentation of market supply schedule. Market supply curve is a horizontal summation of the individual supply curves of the various firms producing a particular commodity in the market.



LAW OF SUPPLY

Other factors remaining constant, the supply of a commodity is directly related with the price of commodity i.e., as price increases, supply increases and vise-versa, ceteris paribus.

Assumption of the law of supply

- **i.** It is assumed that incomes of buyers and sellers remain constant
- **ii.** It is assumed that taste and preference buyers and sellers remain constant
- **iii.** Cost of all the factors of production is also assumed to be constant.
- **iv.** It is assumed that the commodity is divisible.
- **v.** Level of technology also constant.

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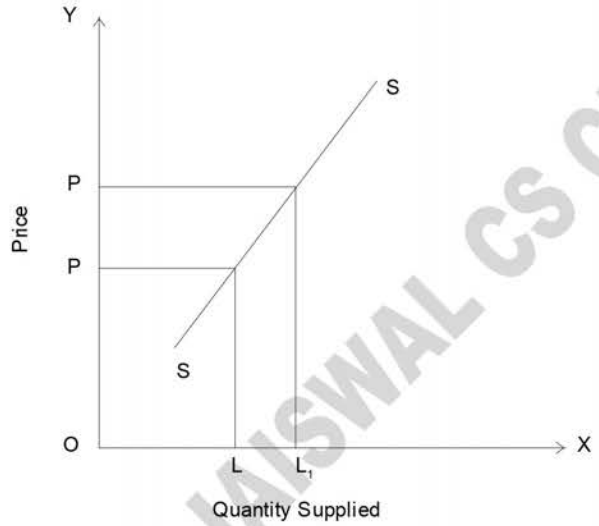
Explanation

Law of supply is explained with the help of supply schedule

P_x(₹)	S_x(Units)
1o	100
11	200
12	300

Above schedule show that quantity supplied increase from 100 to 200 units when price increases form ₹10 to 11 per unit. Implying that there is a position relationship between price and quantity supplied of a commodity.

Diagrammatic Explanation



Supply curve (SS) slopes upward. It shows increase in quantity supplied in response to increase in price of the commodity. Thud quantity increases from OL to OL_1, when price rises form OP to OP_1.

Reasons for Operation of Law of supply

Producers hire and use resources in order to make profits from the sale of the output produced. In economics it is assumed that a common objective of a firm is not only to make profits, but to maximize profits. Hence, since most firms could supply other products apart from the good or service in question, it is unlikely that they would be prepared to supply large amounts of this good and service, if the price were very low, because this implies low profits after production costs have been taken into account.

Exceptions to the law of supply:

Law of supply has also not been free from criticisms. Many economists have criticized this law on many grounds. Some of the important criticisms of this law are as under:

1. **It Explains only the Static Situation:** Law of supply explains only a static situation. It does not consider changes in the factors affecting supply of a commodity like income of buyers and sellers, tastes and preferences of buyers and sellers, change in the cost off actors of production, change in the level of technology etc.

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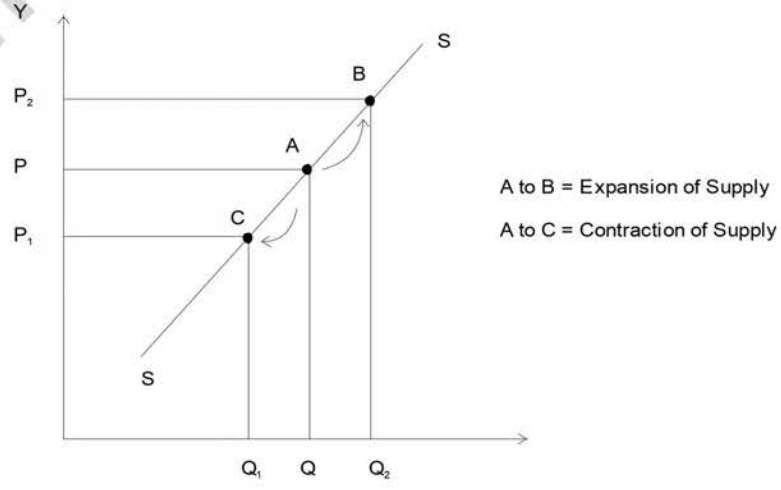
2. **Expectation of change in the Prices in Future**: Law of supply does not apply if there is a hope of change in the price of a commodity in near future. For Examples, if the price of a commodity falls but there is a hope for the price will fall further, supply will not decrease, rather it will increase. Similarly, if the price of a commodity increase ands there is a hope of it increasing further, supply will not increase, rather it will decrease because, the producers would like to store it.
3. **It does not Apply on Agricultural Products**: Supply of a commodity depends upon its production also but this law does not take this factor into consideration. For example, the production of agricultural products depends upon many factors, mainly nature. It cannot be increased, beyond a certain limit, therefore, the supply of such product will always to be re-striated, howsoever, their prices may increase.
4. **It does not apply on Artistic Good**: Law of Supply does not apply on artistic goods also because total supply of these products cannot be changed easily.
5. **It does not Apply on the Goods of Auction**: Law of supply does not apply on the goods of auction also because their supply is always limited and cannot be increased.
6. **It Does not Apply on the supply of Labour in Under-Developed Countries**: Law of supply does not apply on the supply of labor, particularly in Under-developed countries. It has been a general experience in these countries that if the wages of workers are increased, the supply of labour does not increase, rather it decreases because workers feel satisfied by doing less work.

CHANGE IN QUANTITY SUPPLIED

Change in Quantity supplied refers to increase or decrease in quantity supplied of a commodity in response to increase and decrease in price of the same commodity, other things remaining constant. It refers to movement along the supply curve or extension and contraction of supply.

Expansion & contraction of supply:

When the supply of a commodity changes because of the changes in its price, it is called expansion and contraction of supply.



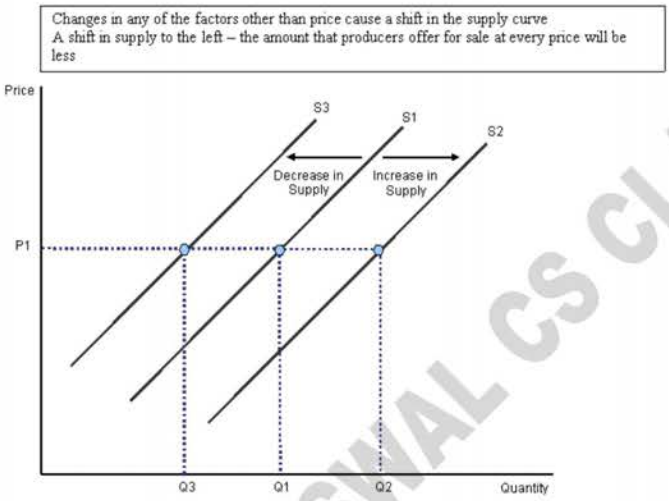
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CHANGE IN SUPPLY

Change in supply, on the other hand, refers to increase or decrease in quantity supplied of a commodity in response to change in other determinants of supply, other than price of the same commodity. It refers to shift in supply curve – forward shift or backward shift.

Increase & decrease in supply:

When supply of commodity changes due to the change in any of the factors other than price it is called increase or decreased in supply.



ELASTICITY OF SUPPLY

Elasticity of Supply is measurement of change in the quantity supplied of a commodity is response to a change in its price. So, it a quantitative aspect of supply. Thus elasticity of supply is the calculation of rate of change in the supply of a commodity in responses to a given change in its price it can be calculated by dividing proportionate change in supply by proportionate change ion price.

Or $e_p = \frac{\text{Proportionate change in Supply}}{\text{Proportionate change in Price}}; ores \frac{\Delta q}{\Delta p} \times \frac{P}{q}$

Method of measuring elasticity of supply

(i) Proportionate or percentage method:

According to this method, elasticity of supply, is the ratio between 'percentage change in quantity supplied' and percentage change in Price' of the commodity.

$E_s = \frac{Percentage change in Quantity supplied}{Percentage change in Price}$

Symbolically, $E_s = \frac{\frac{\Delta Q}{Q} \times 100}{\frac{\Delta P}{P} \times 100} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

Q: Initial Quantity

P: Initial Price

ΔQ = Change in quantity supplied

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ΔP = Change in price of the commodity

$$E_s = \frac{\Delta q}{\Delta p} \times \frac{P}{q}$$

(ii) Point method :

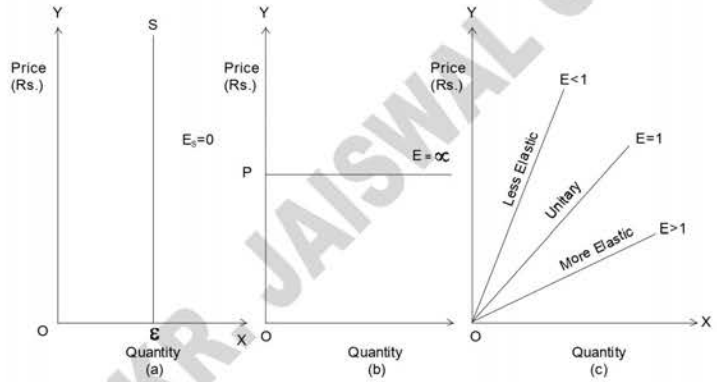
Under this method elasticity of supply is measured at a point on supply curve.

Elasticity of Supply: Values, Descriptions and Diagrams

Normally, the elasticity of supply will be positive. However, it may vary between zero and infinity.

Numerical value of E_S	Economic term
$\varepsilon_S = 0$	perfectly inelastic
$0 < \varepsilon_S < 1$	Inelastic
$\varepsilon_S = 1$	Unitary elasticity
$1 < \varepsilon_S < \infty$	Elastic
$\varepsilon_{S=\infty}$	perfectly (or infinitely) elastic.

The graphical representation of the supply curves of various elasticity would be as under



Supply curves for various elasticities

Note carefully that any straight line supply curve from the origin will be of unitary elasticity throughout its entire length regardless of its slope [diagram (c)]. Elasticity of supply will be less than elastic to its left and more elastic to its right.

i) Arc elasticity:

It measures the elasticity of supply between two prices with the help of following formula.

$$E_s = \frac{\Delta q}{\Delta p} \times \frac{P}{q}; E_s = \frac{q_1 - q_2}{q_1 + q_2} \times \frac{P_1 + P_2}{P_1 - P_2}$$

Where P_1, q_1, are respectively the original price and quantity and P_2, q_2 are the new price and quantity.

FACTORS AFFECTING ELASTICITY OF SUPPLY

1. **Nature of the commodity:** On the basis of their nature, commodities are classified as: (i) perishable, and (ii) durable. Perishable goods cannot be stored, and hence, their supply neither does nor responds in an effective manner to the change in their price. As a result, perishable goods have inelastic supply.

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2. **Time:** Supply of a commodity is determined by the level of production. Time-lag is involved in the production of commodities; whi8ch may range between a day and a few years. Longer the period involved in the production of a commodity more is the time available for changing the size of plant and making other cost adjustments. Ample time is available to adjust supply to changing price, hence supply would be elastic. On the contrary, shorter the period involved in production, more inelastic the supply of a commodity would be.
3. **Techniques of Production:** Simple techniques of production are, by and large, less expensive in nature. If demand 'conditions so require. The producing and supply of such commodities as involve simple techniques of production could be easily increased. In other words, the supply of such commodities involving simple production techniques has elastic supply. On the other hand, if the production technique of a commodity is cumbersome, complex and time-consuming in nature, it would not be possible to change the supply in response to varying price-demand conditions. As a result, supply will be inelastic.
4. **Estimates of future Prices**: future expectations as regard to prices influence the output decisions of the firm. If firm expect the prices to rise in future, they may hold on to the stocks of the commodity and may not make the products available for sale in the market in such a situation, supply would be inelastic. On the contrary, supply would be elastic if prices are expected to fall in future.
5. **Other Factors**: Other factors like Nature of input used, Natural constraints & Risk taking etc.

SUPPLY, DEMAND AND DETERMINATION OF EQULIBRIUM PRICE

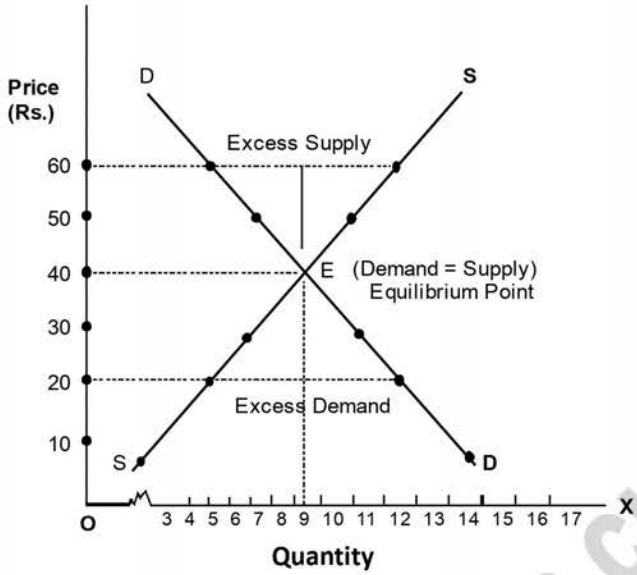
Price as used in economics does not have the same meaning as "value". The value which an individual places on a good or commodity cannot be estimated- it will be different for different people. Price represents "value in exchange"- the value of one good in terms of what it can be exchanged for. Prices are normally expressed in terms money, and determined by the interaction of demand and supply in markets for goods and services.

Determination of the Market Price

The demand for a product and the supply of a product are separate plans of different members of the market, it is necessary to bring the two sides together to establish a price in the market in which the plans of both the consumers and the producers can be satisfied simultaneously

Price Per Unit of Commodity or Good X (₹)	Quantity Demanded for Commodity X in the market	Quantity Supplied for the Commodity or Good X in the Market	Remarks
10	15,000	3,000	Excess demand
20	13,000	5,000	Excess demand
30	11,000	7,000	Excess demand
40	**9,000**	**9,000**	**Demand = Supply (Equilibrium Point)**
50	7,000	11,000	Excess supply
60	5,000	13,000	Excess supply

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In general, it can be observed that at any price above the equilibrium price (where supply equals demand) there will be excess supply and the forces of supply and demand will cause that price to fall to the equilibrium price; and at any price below the equilibrium price, there will be excess and the forces of supply and demand will cause that price to rise to the equilibrium price.

The effect of changes in the conditions of demand and supply on market price

Change in demand has two aspects:

(1) Increase in demand : In case of increase in demand, demand curve shifts to the right
(2) Decreases in demand: in case of decrease in demand ,demand curve shifts to left

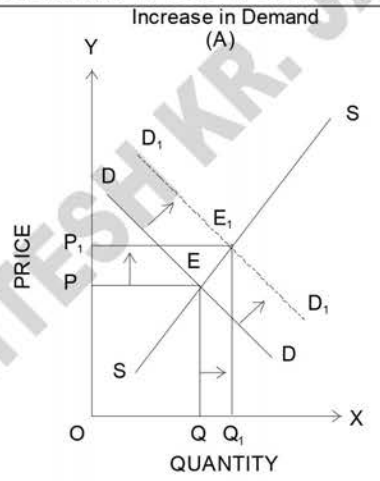


Fig. Shows a situation of increase in demand. The demand curve shifts to the right, from DD to D_1D_1. Equilibrium point shift from E to E_1. Consequently, equilibrium price rises from OP to OP_1 and equilibrium quantity increases from OQ to OQ_1.

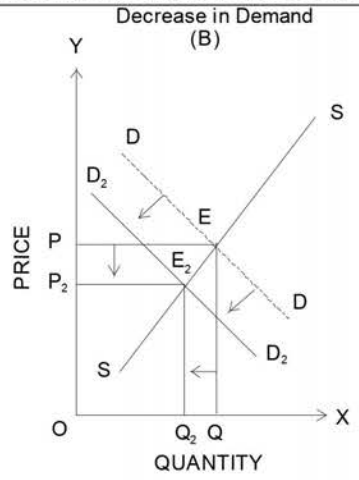


Fig. Shows a situation of decrease in demand. The demand curve shifts to the left, from DD to D_2D_2. Equilibrium point shift from E to E_2. Consequently, equilibrium price falls from OP to OP_2 and equilibrium quantity decreases from OQ to Oq_2.

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When demand curve shifts to the right [D_1D_1 in Fig. 2(A)], demand > supply, corresponding to the existing price. This is a situation of excess demand. This causes a rise in price. Consequent upon the rise in price, quantity demanded tends to decline (implying contraction of demand), quantity supplied tends to rise (implying extension of supply). This process of contraction of demand and extension of supply will continue till such a price is reached where quantity demanded = quantity supplied which occurs at point E_1, the point of new equilibrium.

When demand curve shifts to the left, it shows decrease in demand. Now, at the old price OP, demand < supply, implying a situation of deficiency of demand. This causes a fall in price. Consequent upon fall in price, quantity demanded tends to increase (implying extension of demand), and quantity supplied tends to decrease (implying contraction of supply). This process of extension of demand and contraction of supply will continue till such a price is reached where quantity demanded = quantity supplied. This occurs at point E_2, the point of new equilibrium.

Change in Supply and Market Equilibrium

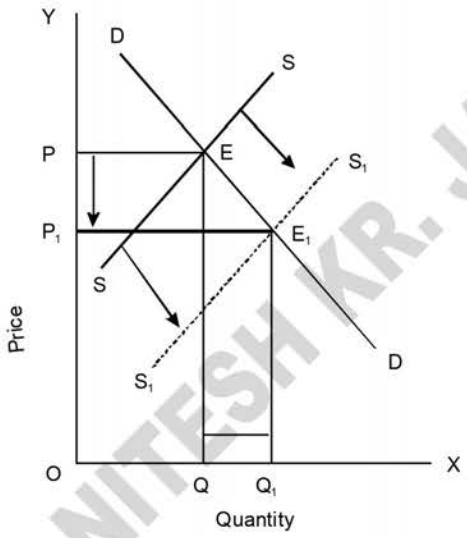
Like demand, change in supply has two aspects:

(1) Increase in supply: In case of increase in supply, the supply curve shifts to the right.

(2) Decrease in supply: In case of decrease in supply, the supply curve shifts to the left.

Increase in Supply

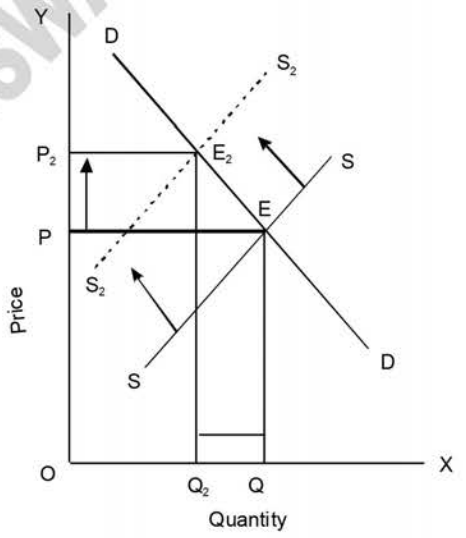
(A)



The figure shows a situation of increase in supply; the supply curve shifts to the right. Consequently, equilibrium price decreases from OP to OP_1. Equilibrium quantity increases from OQ to Oq_1.

Decrease in Supply

(B)



The figure shows a situation of decrease in supply; the supply curve shifts to the left Consequently, equilibrium price increases fromOP to OP_2. Equilibrium quantity increases from OQ to OQ_2.

When supply curve shifts to the right, there is increase in supply. It implies a situation of excess supply (supply > demand). This will cause a fall in price. Consequently, demand will extend and supply will contract. This process (of extension of demand and contraction of supply) would continue till such a price is reached where quantity demanded = quantity supplied. This occurs at point E_1 (the point of new equilibrium) in above figure (A)

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When supply curve shifts to the left, there is decrease in supply. This causes a situation of deficiency of supply (or a situation of excess demand). Accordingly, price tends to rise. In response to rise in price, demand tends to contract and supply tends to extend. This process (of contraction of demand and extension of supply) will continue till such a price is reached where quantity demanded = quantity supplied. This occurs at E_2 (the point of new equilibrium in above figure (B).

THE LAWS OF SUPPLY AND DEMAND IN A FREE MARKET

Excess demand for a commodity will cause a rise in its price.

1. Excess supply of a commodity will cause a fall in its price.
2. Price will settle at one point where the quantity demanded equals the quantity supplied-the equilibrium price.
3. An increase in demand (a movement of the demand curve to the right) will cause a rise in price and rise in the quantity bought and sold.
4. A decrease in demand (a movement of the demand curve to the left) will cause in the price and a fall in the quantity bought and sold.
5. A decrease in supply (a movement of the supply curve to the left) will cause a rise in price and a fall in the quantity bought and sold.

CONSUMER BEHAVIOUR

UTILITY ANALYSIS

In economics, the term 'utility' refers to that quality of a commodity by virtue of which our wants are satisfied. Want satisfying power of a good is called utility. Utility of a good varies with the intensity of the want to be satisfied by its consumption.

Utility versus Realized Satisfaction

A consumer demands a good on the basis of its utility, that is, expected satisfaction and not on the basis of actual satisfaction derived from it. Utility of good not directly related to its actual consumption. Previous experience of the consumer with a good may affect his estimate of its utility and, therefore its demand. But it is its utility upon which a consumer bases his demand for a good.

Measurement of Utility

In economic theory, utility is measured in two ways

i) Cardinal: In cardinal measurement, utility is expressed in absolute standard units. According to cardinal utility concept, it is possible to measure and compare the utilities of two commodities. The cardinalists explain the theory of consumer behaviour on the assumption that utility can be measured. **Utility analysis or cardinal utility analysis:** Propounded by **Prof. Marshall**

ii) Ordinal: ordinal measurement is not expressed in absolute units. According to ordinal utility it is not possible to measure and compare the utility of two commodities. The ordinalists maintain that quantities of utility are inherently non measurable, theoretically, conceptually as well as practically. **Indifference curve analysis or ordinal analysis**: Propounded **by Hicks and Allen.**

Characteristics of utility:

(i) Utility is a Psychosocial concept it means we can only feel it.
(ii) Utility depends upon the intensity of wants.
(iii) Utility is relative i.e. change from man to man, place to place and from time to time.
(iv) Utility has got no social or ethical implication.

Assumption of utility analysis:

(i) Rationality
(ii) The cardinal measurement of utility.
(iii) Constancy of the marginal utility of money.
(iv) Total utility depends upon quantities of individual commodities.

Total Utility, Average Utility and Marginal Utility

Total utility (TU):

Total utility is the total satisfaction which a consumer derives from the consumption of a particular good over a period of time. For example, a person consumes five units of a commodity and derives U_1, U_2, U_3, U_4, U_5 utility from the successive units of a good his total utility will be,

$$Tu = U_1 + U_2 + U_3 + U_4 + U_5$$

Average Utility (AU):

Averageutility is the per unit utility received from the consumption of a commodity.

AU = TU/N

Marginal Utility (MU):

It can describe as the extra satisfaction which a consumer gets from consuming additional unit of a good. More precisely, it is defined as the, addition to the total utility obtained from the consumption of one more unit. For example, the marginal utility of second glass of water is the change in total utility resulting from consuming the second glass of water.

Thus $\text{MU} = \frac{\Delta \text{TU}}{\Delta \text{Q}}$

Here $\triangle Tu$ =Change in total utility and $\triangle Q =$ change in consuming an additional unit of a good. It can also be expressed as $Mu = Tu_n - Tu_{x-1}, Tu_n$ here means total utility derived from the consumption of n units of a good and Tu_{n-1} is the total utility derived from the consumption of $n-1$units.

Relationship between total, average and marginal utility

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It may here be noted that as a person consumes more and more units of a commodity, the marginal utility of the additional units begins to diminish but the total utility goes on increasing at a diminishing rate. When the marginal utility comes to zero or we say the point of satiety is reached, the total utility is the maximum. If consumption is increased further from this point of satiety, the marginal utility becomes negative and the total utility begins to diminish. It should also be noted that when MU is falling, AU also falls but at a slower rate.

THE LAW OF DIMINISHING MARGINAL UTILITY

Initially this law formulated by a German economist H.H. Gossen and it was later used **Marshall to** explain consumer's behavior.

This law states that, "As a consumer increases the consumption of a commodity, keeping constant the consumption of other commodities, the utility obtained from every additional units (i.e. Marginal utility) goes on diminishing. It can eventually fall to zero and becomes even negative".

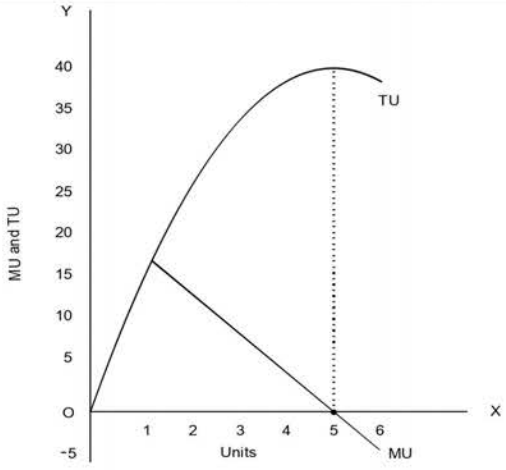
Assumptions:

1. Consumption should be in adequate quality.
2. All the units of the commodity must be equal in size and quality.
3. The consumption should be continuous.
4. There should be no change in the assets in the tastes habits fashion preference and income of consumer.
5. There should be no change in the mental condition of the consumer.
6. Cardinal measurement of utility is possible.
7. Marginal utility of money is assumed to be constant.

Explanation:

We can explain this law with the help of following example or a table

Unit of Mangoes Consumed	Mu	Tu
1	16	16
2	12	28
3	8	36
4	4	40
5	0	40
6	-4	36



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The above schedule and curve show that MU tends to diminish as consumption increases. It is important to note that when MU diminishes, TU tends to increase only at diminishing rate.5th unit of mango does not provide any marginal utility to the consumer and this is the point of maximum satisfaction. If consumers continue consumption on 6th unit than his marginal utility will be negative.

Causes for diminishing Marginal utility

1. **Commodities are not Perfect Substitutes to each other:** The first cause of the application of law of diminishing marginal utility is that the commodities are not perfect substitute to each other. Due to this reason, when a consumer goes on consuming more units of a commodity, it marginal utility goes on declining. If a commodity can be substitute for another commodity, it would have satisfied other wants.
2. **A particular want can be satisfied at a particular time :** Though human wants are unlimited, a particular want can always be satisfied at a particular time. Due to this reason, the intensity of want goes on declining with every successive unit of consumption and sooner or later the consumer reaches at the point of full satisfaction where his marginal utility is zero.

Exceptions to the Law of Diminishing Marginal Utility

There are certain conditions in which the law does not apply. These conditions are known as its exceptions. Important exceptions to this law are as follows:

1. **Very Small Unit of Consumption:** The law does not apply when the unit of consumption is very small. For e.g., if only one spoonful water is provided to a person who is very thirsty, he will not feel satisfied and the marginal utility of next spoon of water will be more.
2. **Money and wealth Accumulation:** This law does not apply on the accumulation of money and wealth. With every successive increase in his accumulation, he gets more satisfaction.
3. **A Drunker:** The law does not hold well on the consumption of liquor. Every additional does of liquor will increase its marginal utility to a drunker.
4. **Music, Recital or Beautiful Scenic View:** The law does not apply on listening to the music, recital of a song or poem or witnessing beautiful scenery.

Importance of Law

Law of diminishing marginal utility is one of the fundamental laws of economics. Some of the important uses of this law are as follows:

1. **A Base of the Law of Consumption:** Law of diminishing marginal utility is the basic law that explains the behavior of consumers. Law of demand, law of equi-marginal utility, consumer's surplus, etc. are based upon this law.
2. **A Base of Diversity in Production:** Law of diminishing marginal utility is the base of diversity in production. In the absence of this law, consumers would have been consuming a single commodity.
3. **A Base of Distinction Between value in use and value in Exchange:** This law solves the riddle of Adam Smith. He was perplexed to know though water and air are so essential and useful

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to life, still they have no value in exchange. Modern economists solved this problem with the help of diminishing marginal utility.

4. **A Base of Taxation Policy :** Almost all the countries of world follow the principle of progressive taxation. This principle is based upon the law of diminishing marginal utility. It follows that the marginal utility of money to a man will be less than to a poor man.

Consumer Equilibrium under Utility Analysis:

Consumer equilibrium is the situation when a consumer secures maximum satisfaction out of his expenditure. Basically, he attains the equilibrium position at a point when he maximizes his total utility given his income and price of commodities he consumes. Under utility analysis, a consumer with a single commodity attains equilibrium at a point where

MU = Price

If MU of additional unit of a commodity is more than its price then Consumer will purchase the commodity, on the other hand if MU from the purchase of additional unit is less than the price then he will not purchase the commodity. He will purchase the commodity up to the point where MU derived form the purchase of additional unit of commodity is equal to its price.

In case of two or more commodities, consumer attains equilibrium at a point where $MU_1 = MU_2 = MU = MU_n$ if price for all commodities are the same. But in case of differences in price the equilibrium equation will be

$MU_1 / P_1 = MU_2 / P_2 = \ldots\ldots\ldots\ldots MU_n / P_n$

LIMITATIONS OF THE LAW

1. We have assumed that the goods on which the consumer spends his money are perfectly divisible. That is to say, these can be bought even in extremely small quantities. The consumer is faced with lumpy goods. They are not divisible into very small quantities. He has to buy an entire quantity of a good or nor at all. This is more so in the case of durable consumption goods. For example, he cannot buy half of a shirt, one-tenth of a bicycle, and the like.
2. The law also suffers from the unrealistic nature of its other assumptions. One assumption is that the consumer has complete knowledge of the prices and availability of all consumer goods. However, this is generally not so. In several cases, the consumer does not possess sufficient information regarding the prices of goods he is interested.
3. The law assumes independence of utility schedules of goods. It means that utility derived from one goods is not affected by the quantity purchased of other goods. In reality, however, many goods are related to each other by being substitutes or complements to each other. In such cases, the marginal utility derived from a given depends not only upon it own quantity, but also upon the quantity of the related good.
4. The law makes a questionable assumption that the consumer is able to accurately determine the marginal utility schedules of all the goods.

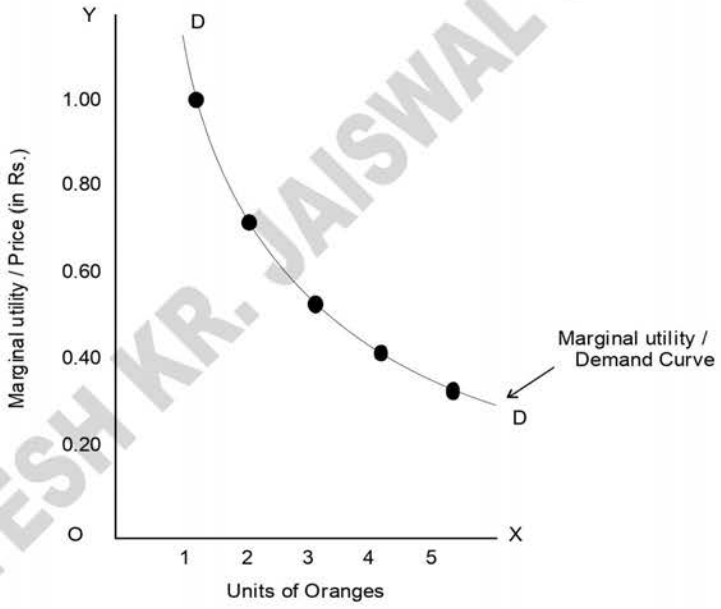
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DERIVATION OF LAW OF DEMAND – UTILITY ANALYSIS

The law of diminishing marginal utility is the basis of law of demand which explain the inverse relationship between the price and quantity of commodity. According to the principle of diminishing marginal utility, a person get less and less utility from additional unit of commodity, naturally he is prepared to buy more units only at lower price. Marshal measures the marginal utility of a commodity in terms of money which a person is willing to pay, naturally, the marginal utility curve itself becomes the demand curve.

Marginal Utility Schedule for Oranges (in money)

No. of Oranges	MU (₹)	Price the consumer is willing to pay(₹)
1st	1.00	1.00
2nd	0.75	0.75
3rd	0.50	0.50
4th	0.40	0.40
5th	0.30	0.30
6th	0.20	0.20



The above table show that the marginal utility of every additional orange is declining and therefore, the consumer will be prepared to buy additional units of oranges only if the price of orange declines in the market.

DD is the marginal utility curve. If we represented price instead of marginal utility on Y axis, DD curve can be called demand curve of the commodity.

Therefore, the downward sloping curve can be taken as marginal utility curve for oranges; it is also the demand curve for oranges.

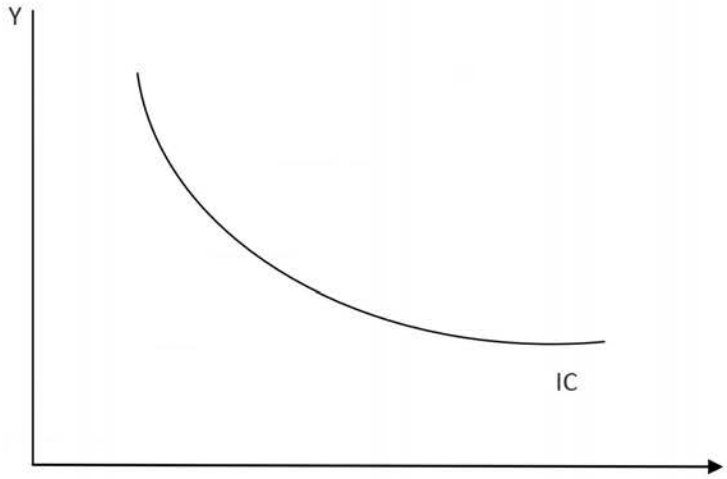
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INDIFFERENCE CURVE THEORY OR ORDINAL UTILITY

Hicks and Allen criticized Marshallian cardinal approach of utility and developed indifference curve theory of consumer's demand. Thus, this theory is also known as ordinal approach.According to this theory, utility is a psychological phenomenon and thus it is unquantifiable. However, the theory assumes that a consumer can express utility in terms of rank. Consumer can rank his/her preferences on the basis of satisfaction yielded from each combination of goods

INDIFFERENCE CURVE

An indifference curve is a locus of all combinations of two goods which yield the same level of satisfaction (utility) to the consumers. Since any combination of the two goods on an indifference curve gives equal level of satisfaction, the consumer is indifferent to any combination he consumes. Thus, an indifference curve is also known as 'equal satisfaction curve' or 'iso-utility curve'. On a graph, an indifference curve is a link between the combinations of quantities which the consumer regards to yield equal utility. Simply, an indifference curve is a graphical representation of indifference schedule.



Properties of indifference curve

1. Indifference curve slope downwards to right

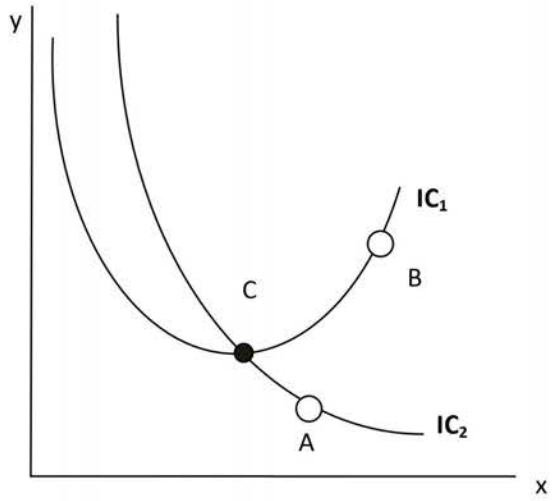
An indifference curve can neither be horizontal line nor an upward sloping curve. This is an important feature of an indifference curve. When a consumer wants to have more of a commodity, he/she will have to give up some of the other commodity, given that the consumer remains on the same level of utility at constant income. As a result, the indifference curve slopes downward from left to right.

2. Indifference curve is convex to the origin

As mentioned previously, the concept of indifference curve is based on the properties of diminishing marginal rate of substitution. According to diminishing marginal rate of substitution, the rate of substitution of commodity X for Y decreases more and more with each successive substitution of X for Y. two goods can never perfectly substitute each other. Therefore, the rate of decrease in a commodity cannot be equal to the rate of increase in another commodity.

3. Indifference curve cannot intersect each other

Each indifference curve is a representation of particular level of satisfaction. The level of satisfaction of consumer for any given combination of two commodities is same for a consumer throughout the curve. Thus, indifference curves cannot intersect each other.

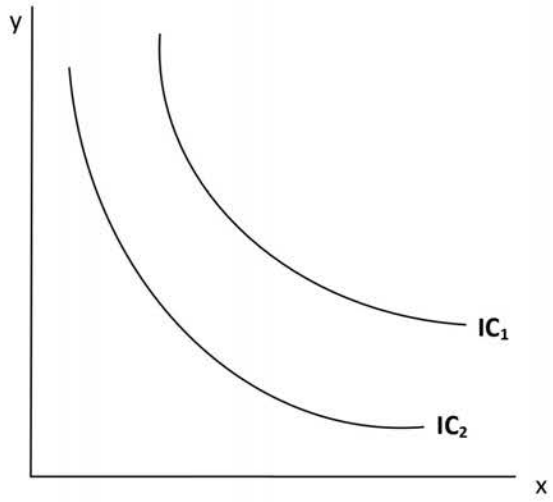


In the above image, IC1 and IC2 are two indifference curves and C is the point where both the curves intersect. According to indifference curve theory, satisfaction at point C = satisfaction at point AAlso, satisfaction at point C=satisfaction at point B But, satisfaction at point B ≠ satisfaction at point A.

Therefore, two indifference curves cannot intersect. Yet, two indifference curves need not be parallel to each other.

4. Higher indifference curve represents higher level of satisfaction

Higher the indifference curves, higher will be the level of satisfaction. This means, any combination of two goods on the higher curve give higher level of satisfaction to the consumer than the combination of goods on the lower curve.



In the above figure, IC1 and IC2 are two indifference curves, and IC2 is higher than IC1

The Assumptions of Budget Equation and the Budget Line:

While discussing the budget of the consumer, for the present, assume the following:

(i) The prices of the two goods (X and Y) have been determined in the market, and they are given and constant for the consumer.
(ii) The consumer has a fixed amount of money income to spend on the two goods.
(iii) Both the goods are MIBs.
(iv) The consumer wants to maximise utility.
(v) He spends all his money on the goods because of (iii) and (iv).
(vi) He can purchase any combination of the goods if his budget permits, i.e., there are no (absolutely) maximum limits on the purchase of the goods.

The above assumptions would lead to the properties of the budget equation and the budget line of the consumer.

The Properties of the Budget Equation and the Budget Line

Suppose that the consumer's money income is denoted by M and the prices of the goods are given to be p_x and p_y.

Then the equation $\mathbf{M = p_x . x + p_y . y}$

is known as his budget equation.

The features of this line are:

(i) It is a straight line in the commodity space, since it is a linear equation in x and y.
(ii) Its slope is negative being equal to $-p_x/p_y$ ($\because p_x, p_y > 0$).
Therefore, the numerical slope of the budget line is p_x / p_y which is equal to the ratio of the prices of X and Y. Since the numerical slope of the line represents the price ratio, or, the relative price of good X in terms of good Y, this line is also called the price line.
(iii) **The intercept form of the budget line is:**
The x-intercept of the budget line is $\bar{M} / p_x$ which is equal to the quantity of good X that the consumer would be able to buy if he spends all his money income (M) on X. Similarly, the y-intercept of the budget line is M / p_y which is equal to the quantity of good Y that the consumer would be able to buy with all his money income.
(iv) Since $\bar{M}$, p_x and p_y are given, can immediately know the intercepts $\bar{M} /p_x$ and $\bar{M}/ p_y$, and is also know the meeting points of the budget line with the x -axis and y - axis. These points would be $(\bar{M}/p_x, 0)$ and $(0, \bar{M}/p_y)$ respectively.
By joining these two points at once have the budget line of the consumer . It may be noted here that, at the point $(\bar{M}/p_x, 0)$, the consumer would buy only good X , and the point $(0, \bar{M}/p_y)$, he would by only good Y. At all other points on the line he would buy a combination of the goods.

The concept of the budget line can be illustrated with the help of a **simple example.**

Suppose $\bar{M}$ = ₹500, p_x = ₹10 and p_y = ₹5. Then, putting these values in , the budget line of the consumer as 500 = 10x + 5y .The x-intercept of the budget line = $\bar{M}/p_x$ = 500/10 = 50 is obtained,

i.e., the consumer would be able to buy 50 units of good X with all his income; and the y-intercept of the line = $\bar{M}/p_y$ = 500/5 = 100, i.e., the consumer would be able to buy 100 units of good Y with all his income. Therefore, (50, 0) and (0, 100) are the two combinations that lie on the line which has been shown in Fig. 6.6. Some other combinations along with these two have been shown in the TABLE

Some of the Combinations of Goods that Lie on the Budget Line

x	y
50	0
40	20
30	40
20	60
10	80
0	100

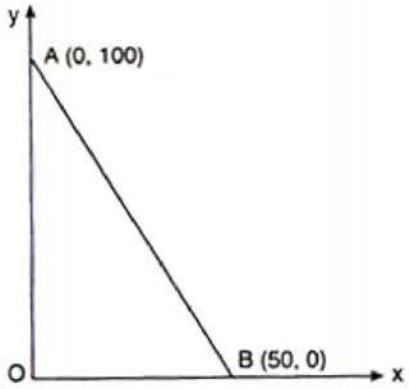


Fig. 6.6 The budget line

(v) Lastly, the slope of the budget line is $-p_x/p_y$ = -10/5 = -2 and the numerical slope of the line is $-p_x/p_y$ = 2/1 = 2:1 which is the ratio of the prices of the goods X and Y. This price ratiorepresents the relative price of good X in terms of (the quantities of) good Y. Here, in the market, price of one unit of good X is 2 units of goods_

Consumer's Equilibrium

The term consumer's equilibrium refers to the amount of goods and services which the consumer may buy in the market given his income and given prices of goods in the market". The aim of the consumer is to get maximum satisfaction from his money income. Given the price line or budget line and the indifference map: "**A consumer is said to be in equilibrium at a point where the price line is touching the highest attainable indifference curve from below**".

Conditions:

Thus the consumer's equilibrium under the indifference curve theory must meet the following two conditions:

First: A given price line should be tangent to an indifference curve or marginal rate of satisfaction of good X for good Y (MRS_{xy}) must be equal to the price ratio of the two goods. i.e.

$MRS_{xy} = P_x / P_y$

Second: The second order condition is that indifference curve must be convex to the origin at the point of tangency.

Assumptions:

The following assumptions are made to determine the consumer's equilibrium position.

(i) **Rationality:** The consumer is rational. He wants to obtain maximum satisfaction given his income and prices.

(ii) **Utility is ordinal:** It is assumed that the consumer can rank his preference according to the satisfaction of each combination of goods.

(iii) **Consistency of choice:** It is also assumed that the consumer is consistent in the choice of goods.

(iv) **Perfect competition:** There is perfect competition in the market from where the consumer is purchasing the goods.

(v) **Total utility:** The total utility of the consumer depends on the quantities of the good consumed.

Explanation:

The consumer's consumption decision is explained by combining the budget line and the indifference map. The consumer's equilibrium position is only at a point where the price line is tangent to the highest attainable indifference curve from below.

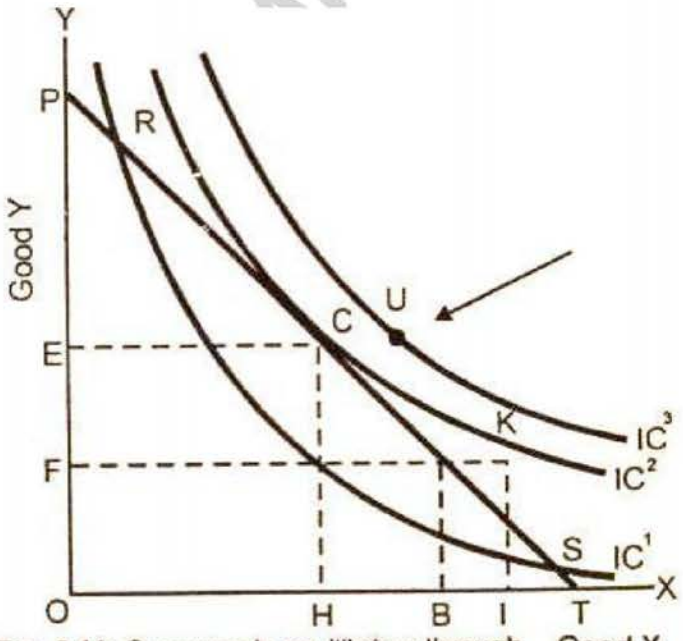


Fig. 3.11: Consumer's equilibrium through indifference Curves

(1) Budget Line Should be Tangent to the Indifference Curve:

The consumer's equilibrium in explained by combining the budget line and the indifference map. In the diagram, there are three indifference curves IC^1, IC^2 and IC^3. The price line PT is tangent to the indifference curve IC^2 at point C. The consumer gets the maximum satisfaction or is in equilibrium at point C by purchasing OE units of good Y and OH units of good X with the given money income.

The consumer cannot be in equilibrium at any other point on indifference curves. For instance, point R and S lie on lower indifference curve IC^1 but yield less satisfaction. As regards point U on indifference curve IC^3, the consumer no doubt gets higher satisfaction but that is outside the budget line and hence not achievable to the consumer. The consumer's equilibrium position is only at point C where the price line is tangent to the highest attainable indifference curve IC^2 from below.

(2) Slope of the Price Line to be Equal to the Slope of Indifference Curve:

The second condition for the consumer to be in equilibrium and get the maximum possible satisfaction is only at a point where the price line is a tangent to the highest possible indifference curve from below. In fig, the price line PT is touching the highest possible indifferent curve IC^2 at point C. The point C shows the combination of the two commodities which the consumer is maximized when he buys OH units of good X and OE units of good Y.

Geometrically, at tangency point C, the consumer's substitution ratio is equal to price ratio $\mathbf{P_x / P_y}$. It implies that at point C, what the consumer is willing to pay i.e., his personal exchange rate between X and Y $\mathbf{(MRS_{xy})}$ is equal to what he actually pays i.e., the market exchange rate. So the equilibrium condition being $\mathbf{P_x / P_y}$ being satisfied at the point C is:

Price of X / Price of Y = MRS of X for Y

The equilibrium conditions given above states that the rate at which the individual is willing to substitute commodity X for commodity Y must equal the ratio at which he can substitute X for Y in the market at a given price.

SUMMARY

Demand means a desire or a wish to buy and consume a commodity or service provided consumer hasadequate ability and is willing to buy.

– The consumer's decisions are guided by several elements, such as income, tastes and preferences etc. and an assumption is established that these factors remain constant.

– Law of demand states that "the amount demanded increases with a fall in price and diminishes with a rise in price".

– Demand for a good by an individual or the market as a whole is conventionally expressed in three alternative forms, namely;

– a demand function
– a demand schedule
– a demand curve

– Demand for a good can change in two ways:
– a consumer moves from one point to another on the same demand curve (Movement along demand curve)
– when the entire demand curve shifts its position (Movement from one demand curve to the other)

– Demand Elasticity:
– Types of demand elasticity: Price elasticity of demand; Cross price elasticity of demand and Income elasticity of demand.

– Five cases of elasticity of demand: Perfectly elastic demand; Perfectly inelastic demand; Relativelyelastic demand; Relatively inelastic demand and Unitary elastic demand
– Methods of measuring price elasticity of demand: Percentage method or Arithmetic; Total expenditure method and Graphic method or Point method.

– Factors affecting the elasticity of demand: Price level; Availability of substitutes; Time period; Proportion of total expenditure spent on the product; Habits; Nature of the commodities; Various uses and Postponing consumption.

– Supply means the quantity of goods offered for sale at pre determined price at a certain point of time.

– Law of Supply states that a firm will produce and offer to sell greater quantity of a product or service as the price of that product or services rises, other things being equal.

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Other things include cost of production, change of technology, price of related goods (substitutes and complements), prices of inputs, level of competition and size of industry, government policy and non economic factors.
– Supply of a good by an individual producer/firm or the market/industry as a whole is conventionally expressed in three alternative forms, namely;
– a supply function
– a supply schedule
– a supply curve

– Supply for a good can change in two ways
– a producer moves from one point to another on the same supply curve (Movement along supply curve)
– when the entire supply curve shifts its position (Movement from one supply curve to the other)

– Supply Elasticity:
– Five cases of elasticity of supply: Perfectly elastic supply; Perfectly inelastic supply; Relatively elastic supply; Relatively inelastic supply and Unitary elastic supply

– Determinants of price elasticity of supply: Time period; Ability to store output; Factor mobility; Cost relationships and Excess supply

– The market price, or equilibrium price, is determined by the interaction of demand and supply at a given time with given conditions of demand and supply.

– Elasticity refers to the ratio of the relative change in a dependent to the relative change in an independent variable. There are two types of elasticities:
– Elasticity of Demand
– Elasticity of Supply

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IMPORTANT TERMS

Ceteris Paribus *Ceteris paribus* or *caeteris paribus* is a Latin phrase, literally translated as "with other things the same" or "all other things being equal or held constant".

Demand Curve A demand curve is the curve showing the relationship between the quantities of a good which consumers would be willing to purchase at alternative prices.

Law of Demand *Ceteris paribus,* the quantities demanded of a good and its own prices are inversely related.

Supply Curve A supply curve is the curve showing relationship between the quantities supplied .

Law of Supply *Ceteris paribus,* the quantities supplied of a good and its own prices are positively related.

Price Elasticity of Demand The relative response of a change in quantity demanded to a change in price. specifically the price elasticity of demand is the percentage change in quantity demanded due to a percentage change in price.

Cross Elasticity The relative response of a change in the demand for one good to a change in the price of another good. More specifically the cross elasticity of demand is percentage change in the demand for one good due to a percentage change in the price of another good.

Income Elasticity The relative response of a change in demand to a change in income. More specifically the income elasticity of demand is the percentage change in demand due to a percentage change in buyers' income.

Price Elasticity of Supply The relative response of a change in quantity supplied to a change in price. Mo specifically the price elasticity of supply is the percentage change in quantity s supplied due to a percentage change in price.

Normal Goods A normal good is a good that reacts positively to changes in buyers' income. If buyers have more income, then they purchase more of a normal good. If they have less income, then they reduce purchases of a normal good.

Inferior Goods An inferior good is one that reacts negatively to changes in buyers' income. If buyers have more income, then they purchase less of an inferior good. If they have less income, then they increase purchases of an inferior good.

Giffen Goods A consumer good for which demand rises when the price increases, and demand falls when the price decreases. Such goods are exceptions to the law of demand.

Superior Goods Goods for which income elasticity of demand is greater than unity. For such goods the proportion of money spent on the goods tends to increase as the income increases

OBJECTIVE QUESTIONS

1. Demand for a commodity refers to :
   - **(a)** Desire for the commodity
   - **(b)** Need for the commodity
   - **(c)** Quantity demanded of that commodity
   - (d) Quantity of the commodity demanded at a certain price during any particular period of time

2. Certain goods for which quantity demanded decrease when income increases are called_____
   - **(a)** Superior goods
   - **(b)** Inferior goods
   - **(c)** Prestige goods
   - **(d)** Conspicuous goods

3. In case of an inferior good, the income elasticity of demand is:
   - **(a)** Positive
   - **(b)** Zero
   - **(c)** Negative
   - **(d)** Infinite

4. For what types of good does demand fall with a rise in income levels of households?
   - **(a)** Inferior goods
   - **(b)** Substitutes

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(c) Luxuries
(d) Necessities

5. In case of Inferior goods like bajra, a fall in its price tends to:

(a) Make the demand remain constant
(b) Reduce the demand
(c) Increase the demand
(d) Contraction of demand

6. Movement along the same demand curve shows:

(a) Expansion of demand
(b) Expansion of supply
(c) Expansion and contraction of demand
(d) Increase and decrease of demand

7. The price of hot-dogs increases by 22% and the quantity demanded for hot dogs decreases by 25% then demand is :

(a) Elastic
(b) Inelastic
(c) Unitary elastic
(d) Perfectly elastic

8. When price falls from ₹6 to ₹4, the demand rises from 10 to 15 units. Calculate price elasticity of demand.

(a) 1.5
(b) 3.5
(c) 0.5
(d) 2

9. What is an Engels curve?

(a) Another name of demand curve
(b) Curve showing both demand & supply curves
(c) Curve named after Lord Engles
(d) All

10. Which factor generally keeps the price-elasticity of demand for a good low:

(a) Variety of uses for that good
(b) Its low price
(c) Close substitutes for that good
(d) High proportion of the consumer's income spent on it.

11. In case of straight line demand curve meeting the two axes, the price elasticity of demand at the mid-point of the line would be:

(a) 0
(b) 1
(c) 1.5
(d) 2

12. An increase in demand can result from:

(a) A decline in the market price
(b) An increase in income
(c) A reduction in the price of substitutes
(d) An increase in the price of complements

13. Compute income elasticity if demand increase by 5% and income by 1%

(a) 5
(b) 1/5
(c) 0
(d) None

14. For a commodity with a unitary elastic demand curve if the price of the commodity rises, then the consumer's total expenditure on this commodity would:

(a) Increase
(b) Decrease
(c) Remains constants
(d) Either increase or decrease

15. What is the value of elasticity of demand if the demand for the good is perfectly elastic?

(a) 0
(b) 1
(c) Infinity
(d) Less than 0

16. What is the original price of a commodity when price elasticity is 0.71 and demand changes from 20 units to 15 units and the new price is ₹10?

(a) ₹15.4
(b) ₹18
(c) ₹20
(d) ₹8

17. If the price of any complement goods rises:

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(a) Demand curve shifts to left
(b) Demand curve shifts to right
(c) Demand curve moves downloads
(d) Demand curve moves upward

18. Cross price elasticity of demand in Monopoly market is:

(a) Elastic
(b) Zero
(c) Infinite
(d) One

19. What is income elasticity of demand. When income changes by 20% and demand changes by 40%

(a) ½
(b) 2
(c) 0.33
(d) None

20. Contraction of demand results due to _____

(a) Increase in price of goods
(b) Decrease in no. of producers
(c) Decrease in output of sellers
(d) Decrease in price of good

21. Giffen Paradox is an exception of

(a) Demand
(b) Supply
(c) Production
(d) Utility

22. Law of Demand is

(a) Quantitative Statement
(b) Qualitative Statement
(c) Both a & b
(d) Hypothetical

23. The demand of which type of goods do not decrease with increase in its price

(a) Comforts
(b) Luxury
(c) Necessities
(d) Capital goods

24. Increase in Price from ₹4 to ₹6 then decrease in demand from 15 units to 10 units. What is the price elasticity. (points elasticity)

(a) 0.66
(b) 5
(c) – 1.5
(d) 2

25. Expansion & contraction of Demand curve occurs due to

(a) Change in the price of commodity
(b) Change in price of substitute or complementary goods
(c) Change in income
(d) None

26. Elasticity between two points

(a) Point elasticity
(b) Arc elasticity
(c) Cross elasticity
(d) None

27. Demand of a commodity depends upon:

(a) Price
(b) Income
(c) Price of related good
(d) All of the above

28. In case of substitute goods, cross elasticity is _____

(a) Negative
(b) Zero
(c) Positive
(d) None of these

29. Suppose the price of movies seen at a theatre rises from ₹120 per person to ₹200 per person. The theatre manager observed that the rise in prices has lead to a fall in attendance at a given movies from 300 persons to 200 persons. What is the price elasticity to demand for themovie?

(a) 0.5
(b) 0.8
(c) 1.00
(d) None of these

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30. The quantity demanded does not respond to price change and so the elasticity is:

(a) Zero
(b) One
(c) Infinite
(d) None

31. The prices of a commodity were increased from ₹4 and ₹6.As a result demand decreased from 15 units to 10 units. What is the price elasticity? (Point elasticity)

(a) 0.66
(b) 0.33
(c) 1.00
(d) 1.5

32. If the demand is parallel to x axis, what will be the nature of elasticity?

(a) Perfectly elastic
(b) Inelastic
(c) Elastic
(d) Highly elastic

33. Other things remaining constant, if the price of the inferior goods decreases then what will be the effect?

(a) Demand increase
(b) Demand decrease
(c) Quantity demanded increase
(d) Quantity demand decreases

34. When price falls from ₹6 to ₹4, the demand rises from 10 to 15 units. Calculate price elasticity of demand.

(a) 1.5 (b) 3.5
(c) 0.5 (d) 2

35. Crose elasticity of perfect substitutes is:

(a) Zero
(b) Negative
(c) One
(d) Infinity

36. What is Engel's Curve?

(a) Curve showing three demand curve
(b) Named after Ernst Engel
(c) Both (a) and (b)
(d) None

37. A consumer spends ₹80 on purchasing a commodity when its price is ₹1 per unit and spends ₹96 when the price is ₹2 per unit. Calculate the price elasticity of demand.

(a) 0.2 (b) 0.3
(c) 0.4 (d) 0.5

38. When the price of cylinder rises from ₹120 to ₹200, the demand falls from 300 to 200. Calculate price elasticity of demand.

(a) 1.00
(b) 0.50
(c) 5.00
(d) None

39. If the price a decreased from ₹10 to ₹8 of a commodity but the quantity demanded remains the same price elasticity is _____

(a) 1
(b) 0
(c) ∞
(d) None

40. Demand for a electricity power is inelastic because _____

(a) It is available at a very high price
(b) It is essential for life
(c) It has many uses
(d) It has many substitutes

41. If income of person increases by 10% and his demand for goods increases by 30% income elasticity will be _____

(a) Equal to one.
(b) Less than one
(c) More than one
(d) None of these

42. In case of luxury goods, the income elasticity of demand will be _____

(a) Zero
(b) Negative but greater than one
(c) Positive but greater than one
(d) Positive but less than one

43. In case of straight line demand curve meeting two axis, the price elasticity of

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demand at the point where the curve meets y- axis would be _____

(a) Zero
(b) Greater than one
(c) Less than one
(d) Infinity

44. Calculate income elasticity for the household when the income of the household increase by 10% and the demand for cars rises by 20%

(a) +2.
(b) -2.
(c) +5.
(d) -5.

45. The commodity whose demand is associated with the name of Sir Robert Giffen?

(a) Necessary good
(b) Luxury good
(c) Inferior good
(d) Ordinary good

46. In expansion and contraction of demand_____

(a) Demand curve remains unchanged.
(b) Demand curve changes
(c) Slope of the demand curve changes
(d) Both (a) & (c)

47. Certain goods for which quantity demanded decrease when income increases are called_____

(a) Superior goods
(b) Inferior goods
(c) Prestige goods
(d) conspicuous goods

48. When price falls by 5% and demand increase by 6%, then elasticity of demand is _____.

(a) Elastic
(b) Inelastic
(c) Unitary elastic
(d) Zero

49. Cross elasticity of complementary goods is:

(a) Positive
(b) Negative
(c) Infinity
(d) None of these

50. Demand of i-pod increase from 950 to 980 and income increase from ₹9,000 to ₹9,800.what is income elasticity?

(a) 0.53
(b) 0.35
(c) 0.43
(d) None

51. Contraction of demand results due to _____

(a) Increase in price of goods
(b) Decrease in no. of producers
(c) Decrease in output of sellers
(d) Decrease in price of good

52- Bricks for houses in an example of which kind of demand?

(a) Composite
(b) Competitive
(c) Joint
(d) Derived

53. Normal goods have _____

(a) Zero goods have
(b) Negative income elasticity
(c) Positive income elasticity
(d) Infinite income elasticity

54. In which of the following cases the demand for goods tends to be less elastic?

(a) Good is necessary
(b) Time period is shorter
(c) Number of close substitutes is less
(d) All of the above

55. _____ shows various combinations of two production that give same amount of satisfaction :

(a) ISO cost curve
(b) Indifference curve
(c) Marginal utility curve
(d) ISO quant

56. Total utility is maximum when:

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(a) Marginal utility is zero
(b) Marginal utility is maximum
(c) Average utility is maximum
(d) Average utility is zero

57. An indifference curve is always:

(a) Concave to the origin
(b) Convex to the origin
(c) L- shaped
(d) A vertical straight line

58. Marginal utility curve of a consumer is also his:

(a) Indifference curve
(b) Total utility curve
(c) Supply curve
(d) Demand curve

59. At equilibrium, the slope of the indifference curve is:

(a) Equal to the slope of budget line
(b) Greater than the slope of budget
(c) Similar than the slope of budget one
(d) None

60. The law of equi marginal utility considers price of money as:

(a) Zero
(b) Less than one
(c) More than one
(d) One

61. Marginal utility approach was given by:

(a) J.R Hicks
(b) Alfred Marshall
(c) Robbins
(d) A.C Pigou

62. Indifference curves between income and leisure for an individual are generally:

(a) Concave to the original
(b) Convex to the origin
(c) Negatively sloped straight line
(d) Positively sloped straight lines

63. Incase of a right angled indifference curve the goods are:

(a) Perfect complements
(b) Perfect substitutes
(c) Inferior goods
(d) Giffen good

64. Indifference curves never intersect each other due to :

(a) Different levels of satisfaction
(b) Same levels of satisfaction
(c) Convex to origin
(d) Concave to origin

65. A budget constraints line is a result of:

(a) Market price of commodity X
(b) Market price of commodity Y
(c) Income of the consumer
(d) All of these

66. The difference between what a consumer is ready to pay and what he actually pays is:

(a) Consumer surplus
(b) Consumer deficit
(c) Both
(d) None

67. Total utility derived from the consumption of a commodity is equal to ₹5. Marginal utility is equal to 1 and consumer has bought 3 units. What will be his consumer surplus?

(a) ₹2
(b) ₹2.5
(c) ₹3
(d) ₹4

68. A consumer buys two commodities X and Y, he would be in equilibrium when:

(a) $\frac{MUx}{Px} = \frac{MUy}{Py}$
(b) $\frac{MUx}{MUy} = MUm$
(c) $\frac{MUx}{MUx} = \frac{MUy}{Px}$
(d) $\frac{Px}{Py} = MUm$

69. The slope of I.C curve of always:

(a) Downward
(b) Upward
(c) Straight line

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(d) Can be all above

70. Which economist said that money is the measuring rod of utility?

(a) A.C Pigou
(b) Marshall
(c) Adam smith
(d) Robbins

71. Marginal utility is a _____ Concept

(a) Cardinal
(b) Ordinal
(c) Both
(d) None

72. Indifference Curves are

(a) Convex to Origin
(b) Concave
(c) Neither 'a' nor 'b'
(d) None

73. Consumer surplus is based on which concept?

(a) Diminishing Marginal utility
(b) Law of Demand
(c) Indifference Curve Approach
(d) None

74. Total utility is maximum when:

(a) Marginal utility is zero
(b) Marginal utility is maximum
(c) Average utility is maximum
(d) Average utility is zero

75. Cardinal approach is related to :

(a) Indifference curve
(b) Equi- marginal utility
(c) Law of diminishing returns
(d) None of these

76. The substitution effect of fall in the price of the commodity will lead to :

(a) Upward movement in indifference curve
(b) Downward movement in indifference curve
(c) Movement from lower IC to a higher one
(d) None

77. The satisfaction which a consumer derives in the consumption of a commodity is equal to ₹320. The price of that commodity is ₹180. what will be his consumer surplus?

(a) 180.
(b) 200.
(c) 140.
(d) 500.

78. The law of equi marginal utility is one of laws within whose parameters Marginal Utility Analysis is framed. The other one is:

(a) Law of diminishing marginal utility
(b) Law of proportions.
(c) Law of consumer surplus
(d) Law of increasing returns

79. When indifference curve is L- shaped then two goods will be _____

(a) Complimentary goods.
(b) Substitute goods
(c) Perfect subsititute goods
(d) Perfect complimentary goods

80. One which approach, indifference curve analysis is based?

(a) Cardinal approach
(b) Ordinal approach
(c) Cardinal and ordinal both
(d) None of the above

81. Indifference curves are convex to the origin because they are based on:

(a) Increasing marginal rate of substitution
(b) Diminishing marginal rate of substitution
(c) Constant marginal rate of substitution
(d) Zero marginal rate of substitution

82. Total utility derived from the consumption of a commodity is equal to ₹5. Marginal utility is equal to 1 and consumer has bought 3 units. What will be his consumer surplus?

(a) ₹2
(b) ₹2.5
(c) ₹3
(d) ₹4

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83. When TU is maximum then MU is?

(a) Zero
(b) Negative
(c) Both
(d) None

84. The supply of a good refers to :

(a) Actual production of goods
(b) Total stock of goods
(c) Stock available
(d) Amount of goods offered for sales at a particular price per unit of time

85. Increase or decrease in supply means

(a) Shift in Supply curve
(b) Movement along same supply
(c) Both (a) and (b)
(d) Neither (a) or (b)

86. If supply curve is perfectly inelastic, the supply curve is :

(a) Vertical
(b) Horizontal
(c) Upward sloping
(d) Download sloping

87. When supply price increase in the short run, the profit of the producer _____ :

(a) Increases
(b) Decreases
(c) Remains constant
(d) Decreases marginally

88. A change in the supply of a commodity along with same supply curve may occur due to:

(a) Change in the price of the commodity
(b) Change in the price of related goods
(c) Change in the future, expectations about the price of the good
(d) Change in the cost of inputs

89. What is the elasticity of supply when price changes from ₹15 to ₹12 and supply change from 6 units to 5 units?

(a) 0.77
(b) 0.87
(c) 0.833
(d) 0.58

90. A perfectly inelastic supply curve will be

(a) Parallel to X axis
(b) Parallel of Y axis
(c) Download sloping
(d) None of these

91. If the supply of a commodity is perfectly elastic, an increase in demand will result in:

(a) Decrease in both price and quantity at equilibrium
(b) Increase in both price and quantity at equilibrium
(c) Increase in equilibrium quantity, equilibrium price remaining constant
(d) Increase in equilibrium price, equilibrium quantity remaining constant

92. When change in the quantity supplied is proportionate to the change in the price, the producer is said to have_____:

(a) Perfectly elastic supply
(b) Relatively elastic supply
(c) Unitary elastic supply
(d) Perfectly inelastic supply

93. Expansion in supply refers to a situation when the producers are willing to supply a :

(a) Larger quantity of the commodity at an increased price
(b) Larger quantity of the commodity due to increased taxation on that commodity
(c) Larger quantity of the commodity at the same price
(d) Larger quantity of the commodity at the decreased price

94. When supply is perfectly inelastic, elasticity of supply is equal to :

(a) + 1
(b) 0
(c) .1
(d) Infinity

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95. If there is an improvement in technology_____:

(a) The supply curve shift to the left
(b) The supply curve shift to the right
(c) Quantity supplied increase
(d) Both (b) and (c)

96. If the price of apples rises from ₹30 per kg to ₹40 per kg and the supply increase from 240 kg to 300 kg. Elasticity of supply is:

(a) 0.75
(b) 0.67
(c) 00.67
(d) 00.77

97. A horizontal supply curve parallel to the quantity axis implies that the elasticity of supply is:

(a) Zero
(b) Infinite
(c) Equal to one
(d) Greater than Zero but less that one

98. Supply refers to quantity supplied at a particular price for a particular period of time:

(a) True
(b) False
(c) Partly true
(d) None

99. When price remains constant and quantity demanded changes, then the elasticity of demand will be:

(a) Vertical of X axis
(b) Horizontal to X axis
(c) Either (a) or (b)
(d) None

100. Increase or decrease in supply menas:

(a) Change in supply due to change in its own price
(b) Change in supply due to change in factors other than its own price
(c) Both of above
(d) None of above

101. When supply Curve shifts to the right there is _____ in supply

(a) An increase
(b) Expansion
(c) Contraction
(d) Decrease

102. Elasticity of supply is defined as responsiveness of quantity supplied of a good to change in ____.

(a) Price of concerned good
(b) Price of substitute good
(c) Demand none
(d) None

103. The supply of the commodity implies?

(a) Total output during a specified period
(b) Its total stock
(c) Its stock available for sale
(d) Its Quantity Offered for sale at a particular price per unit of time

104. Supply of a commodity is a _____.

(a) Stock concept
(b) Flow concept
(c) Both stock and flow concept
(d) Whole sale concept

105. The price of mangoes increases from ₹30 per kilogram to ₹40 per kilogram and the supply increases from 240 kilograms the 300 kilograms. What will be the elasticity of supply for mangoes?

(a) -0.67
(b) +0.67
(c) -0.77
(d) +0.7

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ANSWERS

1	(a)	**2**	(b)	**3**	(c)	**4**	(a)	**5**	(b)	**6**	(c)	**7**	(c)
8	(a)	**9**	(c)	**10**	(b)	**11**	(b)	**12**	(b)	**13**	(a)	**14**	(c)
15	(c)	**16**	(d)	**17**	(a)	**18**	(b)	**19**	(b)	**20**	(a)	**21**	(a)
22	(b)	**23**	(c)	**24**	(c)	**25**	(a)	**26**	(d)	**27**	(d)	**28**	(c)
29	(a)	**30**	(a)	**31**	(d)	**32**	(c)	**33**	(d)	**34**	(a)	**35**	(d)
36	(b)	**37**	(c)	**38**	(b)	**39**	(b)	**40**	(c)	**41**	(c)	**42**	(c)
43	(d)	**44**	(a)	**45**	(c)	**46**	(d)	**47**	(b)	**48**	(a)	**49**	(b)
50	(b)	**51**	(a)	**52**	(d)	**53**	(c)	**54**	(d)	**55**	(b)	**56**	(a)
57	(b)	**58**	(d)	**59**	(a)	**60**	(d)	**61**	(b)	**62**	(b)	**63**	(a)
64	(a)	**65**	(d)	**66**	(a)	**67**	(a)	**68**	(a)	**69**	(a)	**70**	(a)
71	(a)	**72**	(a)	**73**	(a)	**74**	(a)	**75**	(b)	**76**	(c)	**77**	(a)
78	(a)	**79**	(a)	**80**	(b)	**81**	(b)	**82**	(a)	**83**	(a)	**84**	(d)
85	(a)	**86**	(a)	**87**	(c)	**88**	(a)	**89**	(c)	**90**	(b)	**91**	(c)
92	(c)	**93**	(a)	**94**	(b)	**95**	(b)	**96**	(a)	**97**	(b)	**98**	(a)
99	(b)	**100**	(b)	**101**	(a)	**102**	(a)	**103**	(d)	**104**	(b)	**105**	(d)

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CHAPTER 3 COST AND PRODUCTION

PRODUCTION ANALYSIS

Production is an important economic activity. It is an activity directed to satisfy other people's wants through exchange. During the process of production material goods and services are produced or utility is added or created in the material things to satisfy human wants.

Utility may be created in the following ways:

1. **Form utility:** Form utility is created when the existing matter is transformed or rearranged so that it becomes more useful. E.g., a carpenter transforms wooden plants into beautiful furniture a banker convert's flour into bread.
2. **Place utility:** Place utility is created by transporting an object one place to another where it may be more useful. For example, sand at the riverbeds is not useful; once it is brought to the town for construction work it becomes more useful. Thus through transport service place utility is created.
3. **Time utility:** There is always a time lag between the production of goods and their consumption. Goods production in't-1' time are available for consumption in't' time. For example, Rice is harvested in winter, but its demand continues through out the year. It is through storage of rice its supply line can be maintained all the year round. All forms of storage; insurance and speculation create time utility.
4. **Knowledge utility:** Utility can be created through spread of knowledge. A number of tools, machines, equilibrium etc are useful only when people possess necessary knowledge to operate, them for example, a personal computer and an electronic typewriter is useless for a household if it does not know how to operate them.

FACTORS OF PRODUCTION

Land

Land scarce natural resources which are free gifts of nature such as forests, mines, rivers and water, temperature, rainfall, etc. The moment these natural resources come under the ownership of an individual or the society, these start earning in the form of rent, royalty etc.

Characteristics:

i. **Land as a whole has on supply price:** In the sense of space and natural resources, land is available in the same amount whatever the price offered. It is a free gift of nature. An increase in price cannot bring about an expansion of supply; and if the price fell to zero same amount if it would still be available. Thus land as whole has no supply piece.
ii. **Land is immobile:** It cannot be shifted from one place to other like labour and capital. So far as certain natural and climatic conditions are concerned, what are available in one part of the globe are not equally available in other part of the globe. Since the natural factors typical

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of a given place cannot be shifted to the other part we can say that land has place immobility although it may be mobile in use that too, is some what limited because a soil which is more suitable for growing paddy is not equally suitable for growing maize.

iii. **Land is a passive factor if production:** It would not yield result unless deployed usefully through human ingenuity and effort.

iv. **Land differs in fertility:** No two pieces of land possess the same fertility. Mineral resources, river system, forest resources, mountain formation, fertility of soil, etc, differ from region. Land is heterogeneous in use in the sense that it can be used for cultivation, construction of structures, development of road transport system, etc.

v. Although land as a whole has no supply price but when it is dividend into various parts and viewed at micro level, like other factors of production it earn a price depending upon its demand and supply at micro level.

vi. **Quicker application of law of diminishing returns**: It means the proportion of increase in land output tends to be less and less in comparison with increases in input.

vii. **Permanent existence:** No body can create land, nobody can destroy it. It is not perishable like labour.

Labour

Labour may be defined as any exertion of human body or mind undertake with a view to produce material things and service. It is the 'human' element which distinguishes it from other factors because it gives rise to special problems regarding mobility, efficiency, unemployment and psychological attitudes.

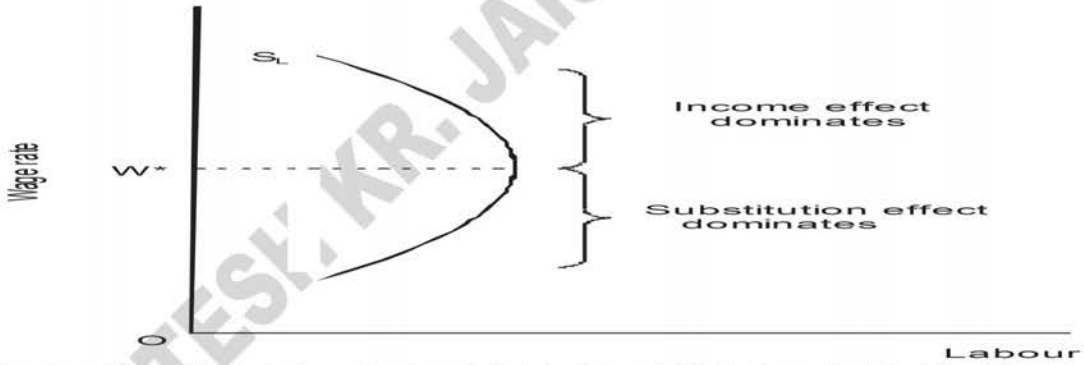
Characteristics:

1. **Labour is an active factor of production:** Without the active particular day and capital cannot produce anything.
2. **Labour is perishable:** It cannot be stored. If the labour does not work on a particular day, that day's labour goes forever.
3. **Labour is inseparable from the labourer:** When labor's services are required, its agent the labourer must go to the worker. Supply of labour depends on the fitness and willingness of the worker to work. Labourers have feeling and emotions. A worker is interested in money wages as well as non monetary return like working conditions and related benefit, pleasantness of the job etc.
4. **Productivity of labour can improve:** Through education, training use of better machinery and equipment, productivity of labour can be improved.
5. **Supply of labour is inelastic during short run:** Supply of labour i.e., labour in demand is related to population. It takes a child more than 15 years to develop into a labourer.
6. **Labour differs in Productivity:** Productively of labour differs as per the efficiency of labourer.
7. **Labour is a human resources and a living factor:** Labour is a live factor of production. Labour has feeling and a kind of temperament which land and capital do not have. Labour is provided by human beings, who participate in production activity. Labour is affected by surroundings and conditions of work.

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8. **Labour has imperfect mobility:** Mobility of labour, both geographical as well as occupational affected by social and economical factors.
9. **Labour as a human capital needs special attention:** Labour require public spending as investment in education, training and public health to improve efficiency in general.
10. **Supply of labour is peculiar:** The basic source of labour supply in a country is its population. Again age structure i.e. division of people in working and non working age groups, sex ratio, social conventions and common desire to work are important factors affecting potential labour supply.
11. **Supply of labour curve is backward bending:** Labour has to make choice between hours of work and hours of leisure. Supply of labour curve of an individual is backward bending. This is because a rise in wage rate generates two effects:
    i) **Substitution effect:** It suggests that with in a increase in wage rate, leisure becomes more expensive as one hour of leisure now costs more. So, the labourer substitutes effort for leisure.
    ii) **Income effect:** Higher wages raises worker's income. If a leisure time is a normal good, than the demand for leisure increases as wage rate increases. The increased consumption of leisure implies less work.

    It is clear that the income effect and the substitution effect work in opposite directions. At lower wage rate (i.e., below W*, in fig.), the labour supply curve is upward sloping. As the wage rate continues to rise (i.e., above W*), the income effect tends to offset the substitution effect. The result is the backward bending labour supply curve of an individual. The aggregate S_L is likely to be upward sloping.



12. **Trade unions:** "United they stand and divided they fall", is the principle. The laborers may combine together in the form of trade unions and resort to collection bargaining in the determination of wage rates. Labourer can refuse to work for pressing his demand. These trade union activities also restrict mobility of labourer.

Capital

Capital is that part of wealth of an individual or community, which is used for further production. Capital is a stock concept, which yields a periodical income, which is a flow concept. Sometimes confusion arises in the use of certain terms similar to capital. It is therefore, necessary to make such distinctions clear.

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1. **Capital and wealth:** Wealth comprises the stock of all reproducible and irreproducible goods. All wealth is not capital. That part of wealth, which is used for further production of wealth, is called capital. Therefore, we can say that all capital is wealth but all wealth is not capital.
2. **Capital and money:** Money is means that is generally accepted by the people as a medium of exchange and a measure of value, and is also used to meet other business obligations. But all money is not capital, that part of money, which is used for further production, is called capital.
3. **Capital and income:** Earning on regular basis either from the ownership of assets, or by doing some economic activity is called income. That part of income, which is saved and used for further production, is called capital. Capital is a stock, where as income is a flow.

Classification of capital:

1. **Fixed and circulating capital:** Fixed capital is one which is durable and which is used in production process for a considerable long time e.g., machines, plant, equipments, factory, building, dams, irrigation canals etc. Circulating capital refers to the capital which is used only once in production. It loses its utility after a single use, e.g., raw materials, seeds coal petrol, gas etc. It regularly needs replacement.
2. **Material and personal capital:** Material capital consists of objects which exist in concrete and tangible form and are capable for being transferred from one to another e.g. machines, tools transformers etc. Personal capital comprises al those energies and habits which contribute to make labour efficient. It includes all personal qualities of an individual which are non transferable e.g., art of dancing and singing, art of painting, art of oratory etc.
3. **Sunk and floating capital:** Sunken capital is one which can be used in a specific occupation. Once invested in a particular business it cannot be withdrawn. E.g. railway bridges, factory building, road dams etc. Capital is said to be floating or free when it can be changed at will for employment in any branch of industry and can at time assume a different form e.g. wood, raw materials, electricity, etc.
4. **Internal and external capital:** The capital which is result of domestic saving in the country is called internal capital. Capital which is imported or invited from abroad and used in recipient country is called external capital. The capital received in India from the World Bank, International Finance Cooperation etc. is an example of external capital.

Capital Formation

By capital formation we mean the surplus of production over consumption is an accounting year which is used for enhancing the productive capacity of a unit. Capital formation, which is also known as investment, plays a vital role for the development of an economy as it strengthens its productive capabilities.

Capital formation depends upon two important factors.

(a) Ability to save

Ability to save depends upon propensity to consume. It has been generally seen that with increase in income the propensity to consume comes down, therefore, with increase in income propensity, saving increases.

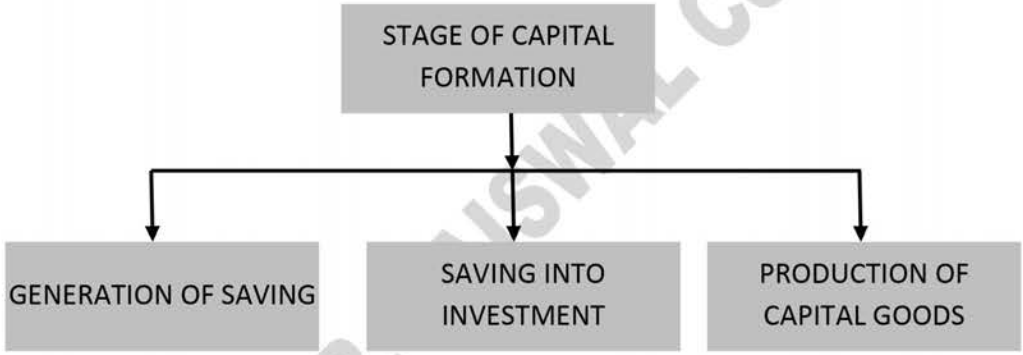
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It is not only the ability to save but also the willingness to save which counts a great deal. A person may have the ability to save but he may not be willing to save. Willingness to save person may have the individual concern about his future as well as the social set up in which he lives.

(b) Opportunities for investment:

Mere ability to save and willingness to save would be useless unless there is a proper atmosphere for investment and there are proper outlets for investment. If an economy experiences internal disturbances and fears foreign aggression people will not feel motivated to save or invest. This is because investors will be totally uncertain about the future of the economy. Similarly too many fluctuations in the money value discourage investment because outcome of investment under such circumstances is not very clear. Not only there should be a proper atmosphere for investment, there should also be proper facilities for mobilization of savings of people from all level, for investment in their own business or through creation of such agencies like banks, insurance companies, provident funds etc.

The stages of capital formation



The process of capital formation has to pass through three different but interrelated stages. These stages are the following.

1. **Generation of saving:** Capital formation depends on savings. Savings are that part of income, which is not spent on consumption of goods. In other words, in order to save more people have to deduct their consumption voluntarily. If people deduct their consumption. Saving will increase is consumption fall resources used in the production of consumption goods will be released. Those resources can be re-absorbed in the industries producing capital goods.
2. **Conversion of saving into investment:** However, generation of savings is not enough. Often people save money but these savings largely go waste. People often hold their savings in the form of idle balance (as in rural areas), or even purchase unproductive assets like gold and jewelry, thus the generation of savings is just a necessary but not a sufficient condition of capital formation. To accelerate the rate of capital formation it is absolutely essential to convert savings of the household sector into loan able funds. This task is performed by the banking (financial) system of the country.

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3. **The actual production of capital goods:** Banks and financial institution convert the savings of household sector into loan-able funds. Such funds are acquired by business to purchase capitals goods like plant, equipment, machinery, etc. When business firms borrow money at interest, they to not keep the funds idle. They place order for machines and structures and make advance payments to the suppliers of capital goods. Thus the third stage of capital formation is concerned with the actual production of capital goods. Thus process of capital formation is concerned with the actual production of capital goods. The process of capital formation is not complete unless business forms acquire capital goods so as to expand their production capacity.

Entrepreneur:

Entrepreneur is that person who initiates and undertakes the risk of business.
The various functions performed by an Entrepreneur are:

a) **Initiating a Business Enterprise and Resource Co-ordination:** The first and the foremost function of an Entrepreneur is to initiate a business enterprise. For this, he collects different factors of production such as labour, capital, and co-ordinates them. These various other factors of production are paid fixed contractual remuneration; labour a fixed wage, land a fixed rent and capital a fixed rate of interest. The surplus, if any, goes to the Entrepreneur is called profit which is not fixed; it may be positive or negative.

b) **To Take Advantage of Changes in a Dynamic Economy:** The major function of an Entrepreneur in a dynamic economic is to take advantage of changes to expand their sales and to promote their business. As a result of changes in economic conditions, there will be difference between expected receipts and realized as they could not take account such a change while making their production decisions. Such changes may affect the firm favorably or unfavorably. That is why, profits are also called dynamic surplus.

c) **To Bring About Innovations:** Innovation constitutes an act of practical application or commercial use of an invention. Innovator is a man with vision, initiative and drive. When an Entrepreneur introduces an innovation, it generates surplus over cost of innovation which is called profit, provided that the following conditions are satisfied :
   i. The price of the innovated commodity does not fall below its cost.
   ii. The average cost of production with new techniques is less than that with earlier techniques.

   If these conditions are fulfilled, then an innovator earns profit.

d) **To Bear Uncertainties:** An Entrepreneur bears uncertainties which involve risk. Rather are those risks which cannot be foreseen. That is why profit is described as the reward for uncertainly bearing rather than for risk bearing.

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PRODUCTION

According to classical economists Adam Smith, Karl Mark etc. Production means the creation of physical product and production of services is not included in the preview. But modern economist do not agree with this view according to them Man can neither produce a physical product not he can destruct it. He can change only the form of physical product.

Production Function When one factor is a fixed factor and the other is a variable factor, production function may be specified as under:

$Q_x = f(L. \overline{K})$

Here, Q_x= Output of Good-X

L: Labour, a variable factor.

$\overline{K}$: Capital, a fixed factor.

In this type of production function, output can be increased only by increasing the application of L (the variable factor). The following equation illustrates this point further:

$40_x = f(5_L, 4_{\overline{K}})$

$45_x = f(6_L, 4_{\overline{K}})$

We find that K is constant at 4 units. Output increases form 40 to 45 units of commodity-X because input of L has increased from 5 to 6 units. Since K is constant and only L changes, the ratio or proportion between L and K tends to change.

Fixed & Variable factors of production

Fixed factor are those factors of production which cannot be change during short period viz, land, plant & machinery etc.

While variable factors of production are those factors which can be changed as desired short period.

Short Run & Long Run:

A short period it that period of time in which a firm cannot change some of its factors of production like plant building etc.

Long period is a time period during which firm can increase or decrease any of the factors productions. Thus all the factors of production are variables in lone run and the quantity can go from zero to infinity during this period.

Assumption of production functions:

1. It is related to specific period of time
2. State of technology is assumed to remain constant.
3. It is assumed that the firm is using the best and most efficient techniques of a production.
4. The factors of production are divisible into small units.

TP (Total Product)

TP is the sum total output of each units of the variable factors used in the process of production. This is also called total return of the variable factor.

Examples: If L (labour) and K (capital) are the variable and fixed factors respectively and if 6 units of L are used (along with some fixed amount of K.) and if their contribution to output is 10,12,15,12,10,6 units respectively, then

TP = 10+12+15+12+10+6 = 65 units of the commodity. $\boxed{TP = \sum MP}$

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MP (Marginal Product)

MP is additional output attributed to an additional unit of the variable factor, other factors remaining constant.
Generalizing it we can say that:

$MP_{nth} = TP_n - TP_{n-1}$

If you have understood the process of estimating MP, you should also understand the fact that by adding up MP of all units of a variable factor, we get TP.

TP = $\sum_{i=1}^{n} MP_i$

AP (Average Product)

AP refers to physical output per unit of the variable factor used in the process of production.

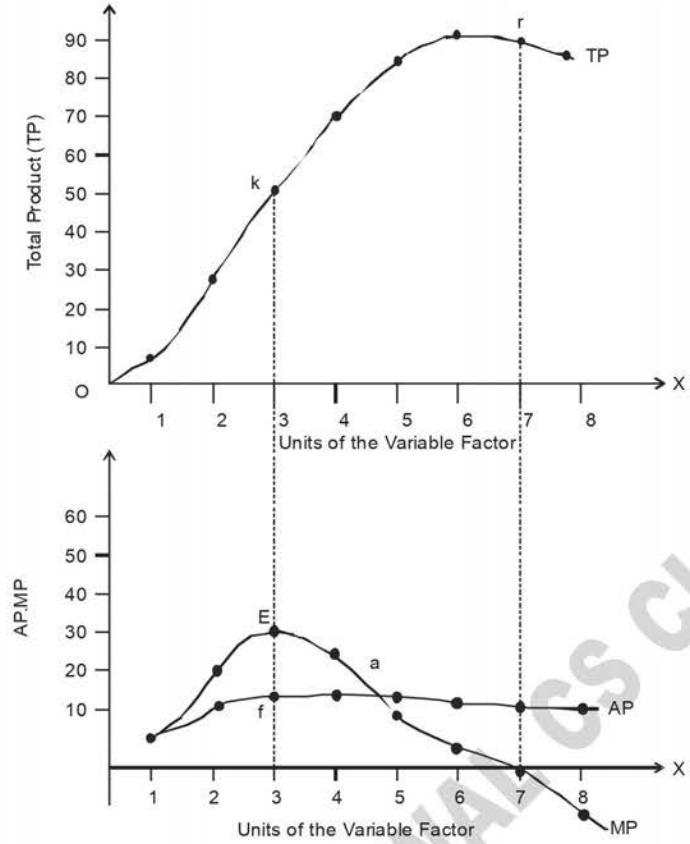
AP = $\frac{TP}{L}$

Relation between: (i) TP and MP, and (ii) AP andMP

Following Table and Fig. illustrate how TP, MP, and AP are related to each other.

Units of Land (Hectares) – Fixed Factor	Units of Variable factor (L) (No. of Workers Employed)	MP (Output of rice In tonnes)	TP (= $\sum MP$) (Output of Rice in tonnes)	AP = $\left(\frac{TP}{L}\right)$ (output of Rice in tonnes)
1	0	-	0	-
1	1	6	6	6
1	2	14	20	10
1	3	28	48	16
1	4	24	72	18
1	5	8	80	16
1	6	4	84	14
1	7	0	84	12
1	8	-4	80	10

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Observations: Relation between MP and TP

- MP is increasing till 3 units of labour are employed. Accordingly, between O to K, TP is increasing rate.
- Between 3 to 7 units of labour. MP is declining. Accordingly, between K to r, TP is increasing at diminishing rate.
- When 7 units of labour are employed, MP=0. Accordingly, at point r, TP is maximum.
- Beyond 7 units of labour, MP becomes negative. Accordingly beyond r. TP starts declining.

Observations: Relation between AP and MP

- AP increases so longs as MP>AP. It happens in Fig.2 out till point 'a' where AP is at its top.
- AP decreases when MP<AP. t happens in Fig. 2 beyond points 'a' where AP is at its top.
- AP is at its maximum when AP=MP. It is exactly at point 'a' Fig. 2. Thus, MP curve cuts AP from its top.
- MP may zero or negative, but AP continues to be positive.
- Before points a, where AP=MP, MP can be positive.

The law of variable proportions

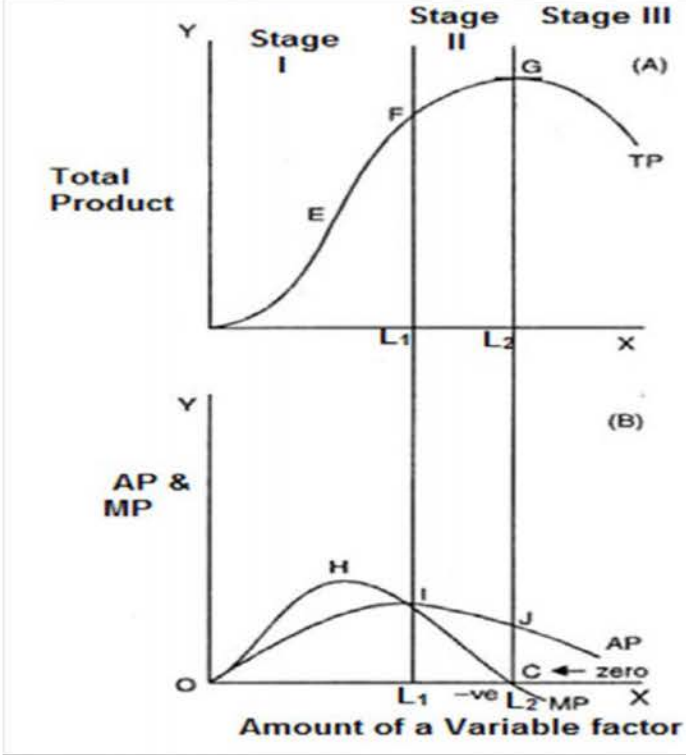
The law of variable proportions states that as the amount of certain factors are increased, keeping constant the amount of certain other factors, production obtained from every additional doses of variable factor increases in the beginning but after a stage it goes on diminishing.

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Units of Land	Units of Labour	Total Product	Average Product	Marginal Product	
1	1	2	2	2	Increasing MP
1	2	5	2.5	3	Implying increasing
1	3	9	3	4	Returns to a factor
1	4	12	3	3	Diminishing MP
1	5	14	2.8	2	Implying diminishing
1	6	15	2.5	1	Returns to a factor
1	7	15	2.1	0	
1	8	14	1.7	-1	Negative MP Implying negative Return to a factor

Point of inflexion: It is that point where TP stops increasing rate and begins increasing at decreasing rate

The Table shows that as more and more units of labour are used, MP (marginal product) tends to rise till 3 units of labour are employed. In this situation TP (total product) increase at the increasing rate. This is a situation on increasing returns to the factor.
But, with the application of 4th units of labour, situation of diminishing returns sets in: MP starts decreasing and TP increases only at the decreasing rate.
Diminishing MP reduces to zero. Total output is maximum (=15), when marginal output is zero.
Eventually, MP may be negative. Now output (TP) starts declining as from 15th to 14th when 8th unit of the variable factors is employed.



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Stages of Production

– First, Total product first increases at an increasing rate and then at a decreasing rate and this continues till the end of this stage. Average product is continuously increasing. MP first increases, becomes maximum and then starts falling. But the marginal product remains higher than the average product, that is, MPL>APL. The stage I ends where average product reaches its highest point, so here, the efficiency of variable factor (labour) is maximum. There are two important reasons for increasing returns: (i) indivisibility and (ii) specialization.

– In the second stage, total product continues to increase at a diminishing rate until it reaches its maximum point at the end of this stage. Both AP and MP diminish, but remain positive. At the end of the second stage, MP becomes zero. TP is maximum when MP is zero. AP shows a steady decline throughout this stage. Since both AP and MP decline, this stage is known as stage of diminishing returns. The main cause of application of the law of diminishing returns is the scarcity of fixed factor or the other factor of production.

– In the third stage, total product will start declining. The marginal product of the variable factor will become negative whereas the average product will remain greater than zero. The phenomenon of negative returns emerges as a result of application of excessive units of variable factor in relation to fixed factor, with the result that TP starts diminishing.

Graphic Presentation of Law of Variable Proportions

Three stages of law of variable proportions are graphically illustrated in the above figure graphically presents the stages of production on account of change in variable factor when other factor remains constant. On x-axis, the quantity of the variable factor is measured whereas total product, average product and marginal product are measured on y-axis. Top panel of the shows the total product curve and bottom panel shows average and marginal product curves.

Stage 1: It continues till the firm employs OL1 units of variable factor.

– In this stage, MP first increases and reaches its maximum shown as point H in lower part of the figure.

After reaching its maximum, it continues to decline in Stage 1.

– It is important to note that though MP starts declining in this stage after point H, it still remains higher than AP whereas AP continues to increase in Stage 1 and becomes maximum at the end of this stage.

– Corresponding to varying behavior of MP, TP increases at an increasing rate till the point of inflection as shown by point E in the upper part of the diagram.

– After point E, TP increases but at a decreasing rate upto point F in Stage 1.

– It should be noted that Stage 1 ends at the point where MP and AP are just equal to each other. In other words, this stage ends when MP curve coincides with AP curve at its maximum point.

Stage 2: It continues till the firm employs OL2 units of variable factor.

– In this stage, MP continues to decline and cuts horizontal axis at point C at the end of the Stage 2.

– As against Stage 1, MP remains lower than AP at all points in Stage 2. AP starts falling and continues to decline in the positive zone.

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– Corresponding to the behavior of MP, TP continues to increase at a decreasing rate till MP remains
positive and reaches its maximum as shown by point G in the upper part of the diagram when MP turns
zero i.e. at point C.
– It can be noted that point G and C lie directly over each other at OL-2 units of employment of the variable factor.
Stage 3: It starts after firms crosses OL2 units of employment of the variable factor.
– In this stage, MP has turned negative from being zero at the start of this stage.
– AP still continues to decline as in Stage 2 but it remains positive.
– Corresponding to negative MP, TP starts declining in Stage 3 after reaching its maximum at the start of this stage.
– It can be noted that if firm still employs more units of the variable factor, MP will decline further in the negative zone and correspondingly TP will also continue to fall.

Causes on Increasing Returns to a Factor

i. **Fuller Utilization of the Fixed Factor:** In the initial stages, fixed factor remains underutilized. Its fuller utilization calls for greater application of the variable factor. Hence, initially, additional units of the variable factor add more and more to total output, or marginal product of the variable factors tends to increase.
ii. **Increased Efficiency of the Variable Factors:** Additional applications of the variable factor causes process based division of labour that raises efficiency of the factor accordingly; marginal productively of the factor tends to rise.
iii. **Better Co-ordination between the Factors:** So long as fixed factor remains underutilized, additional application of the variable factor tends to improve the degree of co-ordination between the fixed and variable factors. As a result, total output increases at the increasing rate.

Causes of Diminishing Returns to a Factor

The Law f diminishing returns may be explained in terms of the following factors:

i. **Fixity of the Factor:** Fixity of the factor(s) is the principle causes that explains the occurrence of the law of diminishing returns. As more and more units of the variable factor continue to the combined with the fixed factor, the latter gets over-utilized. Hence, the diminishing returns.
ii. **Imperfect Factor Substitutability:** Factors of production are imperfect substitutes of each other. More and more of labour, for e.g., cannot be continuously used in place of additional capital. Accordingly, diminishing returns to the variable factor become inevitable.
iii. **Poor Co-ordination between the factors:** Continuous increasing application of the variable factor along with fixed factor(s) beyond a point crosses the limit of ideal factor-ratio. This results in poor co-ordination between the fixed and variable factors. The law of diminishing returns accordingly sets in.

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Stages of operation:

A rational producer will never produce in stage III. Where marginal product of variable factor is negative the rational producer will also not produce in stage I, where MP of the fixed factor keeps on increasing. So 1st and 3rd stage are called stage of economic absurdly or economic nonsense. A rational producer will always produce in stage II, where both MP and AP of the variable factor are diminishing. At third particular point in this stage, the producer will decide to produce depend upon the price of factors, etc.

Assumption of the Law

The law of variable proportions is based on certain assumptions.
These are as follows:

i. Ratio in which factors of production are combined can be changed.
ii. Units of the variable factor are homogeneous or equally efficient, and are increased one by one. Thus, diminishing return starts occurring not because latter units of the variable factors are less efficient than the former ones, but because of the fixity of the factor.
iii. State of technology does not change.
iv. We consider only physical input and output and not economic profitability in monetary terms.
v. These must be some input whose quality is kept fixed.
vi. The law does not consider the cases where the inputs are either perfect substitute or perfect complementary to each other. The inputs are assumed to be imperfect substitute to each other.

A Situation of Constant Returns to a Factor

Between the situation of 'increasing returns to a factor' and 'diminishing return to a factor', a firm may undergo a situation of constant return to a facto. It is a situation when MP of the variable factor tends to remain constant even when more and more of the variable factor is combined with the fixed factor(s). When MP is constant (say =10), TP will increase only at a constant rate: every time it will increase by 10 units of output.

Postponement of the law

1. The Law of variable proportions may become inoperative for time being due to improvement in the technique of production.
2. Also, the applicability of the law can be postponed when some substitute of the fixed factors is discovered.

Limitations of law 0f Variable Proportion

The Law of variable proportion is based on unrealistic set of assumption.

First, the homogeneous units of variable inputs are not logical. Every unit of labour is different from each other.

Secondly, the assumption of constant input prices and technique of productions also seems unrealistic in the present dynamic world.

RETURNS OF SCALE

Returns to scale explains the behavior of output when quantity of all factors of production changed in the same proposition. When all the inputs are increased in the same ratio following three stages are noticed.

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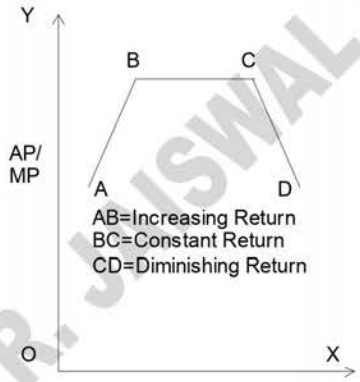
i. **Increasing return to scale:** when inputs are increased in some proportion ant the total output increases in more than that proportion
ii. **Constant return to scale:** when inputs are increased in some proportion ant the total output increases in same proportion
iii. **Diminishing return to scales**: when inputs are increased in some proportion ant the total output increases in less than that proportion

Assumption:

i. Operational in long period
ii. All factors are variable
iii. Technological condition can be fully changed.

Production Schedule

Land	Labour	Product	Conclusion
2 Acres	4 units	100 units	
4 Acres	8 units	220 units	Increasing Returns to scale
6 Acres	12 units	330 units	Constant Returns to scale
8 Acres	16 units	400 units	Diminishing Returns to scale



Reasons for increasing return to scale:

Reasons for increasing returns to scale are internal and external economics. Internal economies are use of better and advanced machine, use of better management, division of labour, marketing facilities, use of cheap financial resources etc. External economies are better transportation facilities, banking facilities etc.

Reasons for diminishing return to scale:

Reasons for diminishing return to scale are diseconomies of production. Large scale production which appears when a firm persists in expanding its productions after achieving the level of optimum output.

Constant returns operate when the firm has attained the optimum size or when the factors are in their best combination.

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DIFFERENCE BETWEEN RETURNS TO A FACTOR AND RETURNS TO SCALE

Returns to a factor	Returns to scale
1. The law applies in the short-run.	1. The law applied in the long-run.
2. In this the level of production is changed.	2. In this, scale of production is changed.
3. In this, only the units of variable factors are changed and the units of fixed factors remain the same.	3. In this, all factor of production is changed in the same proportion.
4. These are three stages in this law (a) increasing returns. In this stage, TP and AP rises, MP rises and starts falling. (b) Diminishing returns-in this stage, TP raises at a diminishing rate, AP and MP declines. (C) Negative returns-in his stage, TP and AP declines and MP becomes negative.	4. These are three stages in this law: (a) Increasing return-it occurs when increase in output is more than proportional to increase in inputs. (b) Constant returns-it occurs when increase in output is proportional to increase in inputs. (c) Decreasing returns-it occurs when increase in output is less than proportional to increase in input.
5. Increasing returns are due to use of fixit of fixed factor of production.	5. Increasing return is due to: Economies of scale. It includes both internal and external economies.
6. Diminishing returns are due to use of fixed factor at optimal capacity.	6. Decreasing returns are due to: Diseconomies of scale. These are basically managerial.
7. A rational producer will always operate in stage II with diminishing returns.	7. There is no stage which is the best in the long-run.

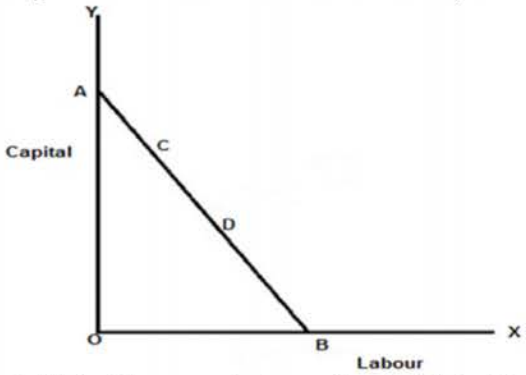
ISOQUANTS:

An isoquant is the locus of all the combinations of factors of production which produces a given level of output. Alternatively, an isoquant includes all the technically efficient methods of production of a commodity which produces a given level of output. The isoquant can be of different shapes depending upon the degree of substitutability of factors of production. An isoquant can be of four different shapes:

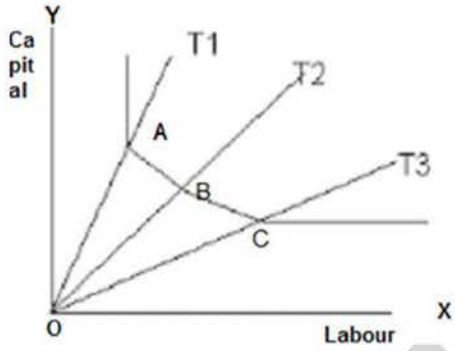
1. Linear isoquant: linear isoquant assumes perfect substitutability of factors of production. If factors of production are perfectly substitutable then a unit of commodity can be produced by employing only labour or only capital or by any combination of capital and labour. The figure below presents the shape of linear isoquant. Given the perfect substitutability of factors of production, the rate of substitution between two factors (labour and capital) of production on all the points remains constant. Producer can produce maximum output by using OA amount of

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capital or OB amount of labouror any combination lying on isoquant AB.



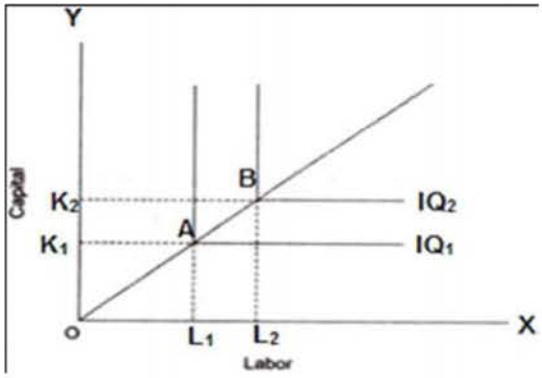
2. Kinked Isoquant: According to kinked isoquant curve, there is a limited substitutability between the factors of production. Substitution is limited because there are only few processes for producing any commodity which are represented by kinks on the isoquant. Thus, substitution is possible only at the kinks . This form of isoquant is called '**activity analysis-isoquant' or linear programmingisoquant** because it is basically used in linear programming.



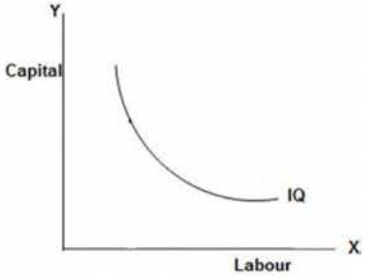
The shape of kinked isoquant is presented in the above . There are only three points on the isoquants such as A, B and C where substitution is possible between labour and capital. On the other hand, except on points A, B and C, it is not possible to change the composition of two factors of production.

3. Input-output isoquant: In case of input-output isoquant the rate of substitution between two factors of production is zero because it assumes strict complementarily between the factors of production. It means there is only one method of production to produce a commodity. This kind of isoquant is named after Leontief who invented the input-output analysis. As shown in the Figure below point A on IQ1 is the onlycombination of capital and labour which produces given amount of good efficiently.

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4. Convex Isoquant: this shape of isoquant assumes continuous substitutability between factors of productions only over a certain range, beyond which factors cannot be substituted for one another. It is so because, as we substitute capital for labour then the rate of substitution will decline. As we move down along isoquant the shape of isoquant gets flatter

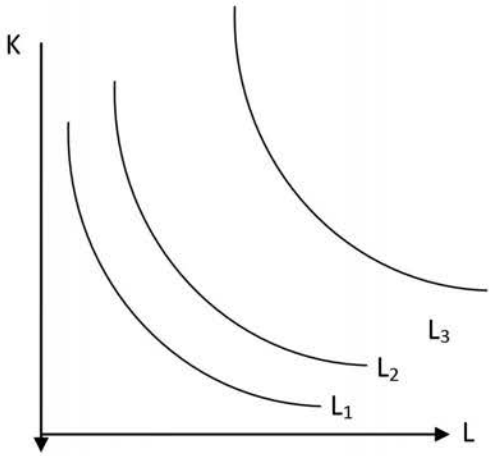


Some properties of Isoquants

1)	Isoquants are negatively sloped
2)	They are convex to origin
3)	Throughout one isoquant the level of production remains same
4)	Higher the isoquants higher is the level of production.
5)	Isoquants never intersect each other.

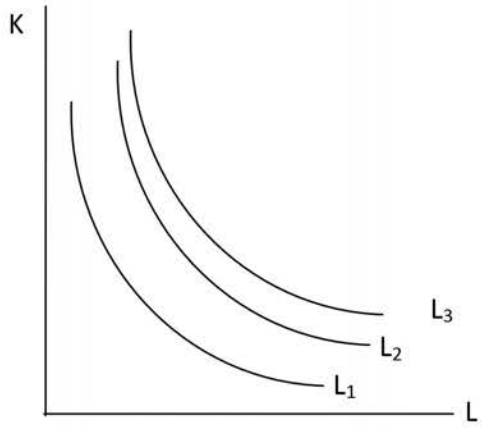
Relationship between isoquants and Returns to scale

1. If the gap between isoquants increases then it is **Increasing Returns to Scale** this is shown in the following diagaram:

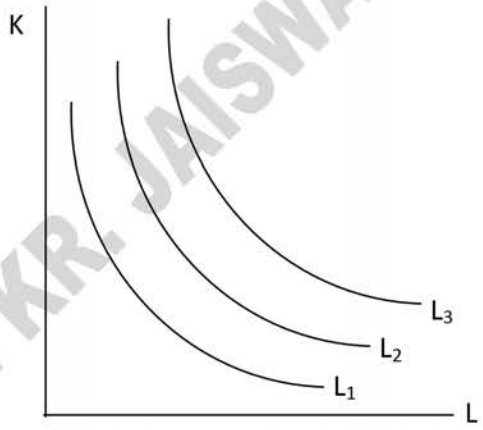


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2. If the gap between the isoquants decreases it is **decreasing returns to scale** as shown in the following diagram:



3. If the gap between the isoquants remain constant it is **constant returns to scale** as shown in the following diagram.



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COST ANALYSIS

Payment for the factors of production is called cost like payments for the labours i.e wages is cost. Cost is only paid when there is production, so cost function is also called derived function. We can write the cost function as follows;

C=f(q)

We can also write th cost equation as follows

C= wl+rk

TYPES OF COST

There are **two types** of cost depending upon the type of production function:

1) Short run cost

Since there are two kind of variables in short run so there will be two type of cost in **short run :**

a) fixed cost:

Fixed cost is that cost which remains fixed **irrespective of the level of production**. If there is low or high amount of production the fixed cost remains constant for example **the rent** of the factory which has to be paid irrespective of the fact that there is production or strike.

b) variable cost:

As the level **of production increases** the amount **of variable cost also increases**. It is that payment which varies with the level of production like the **payment for raw materials** is variable cost as it increases with the level of production

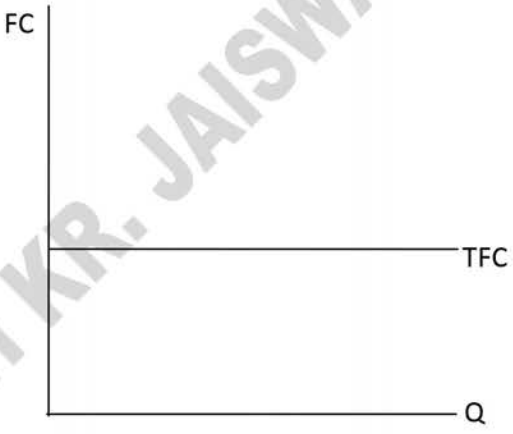
2) Long run cost

In **long run** all factors of production is variable so there will **be only variable cost.** Like the payments of the establishment, payments of advertisements, raw materials, wages etc

GRAPHICAL EXPLANATIONS

Short run costs

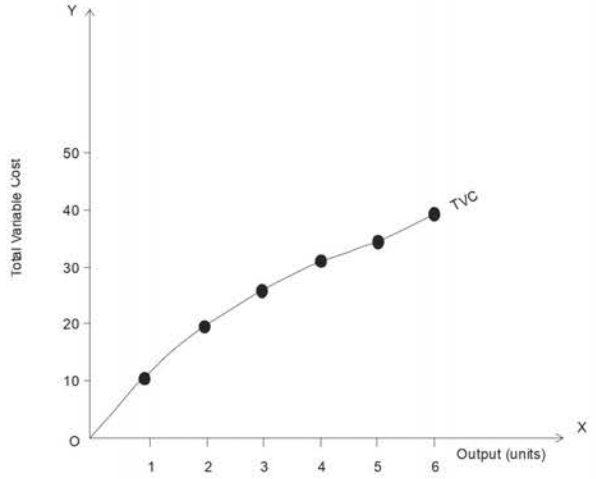
(a) Fixed cost: since it do not vary with the level of output so **fixed cost is horizontal** to the x-axis asshown in the following diagram:



(b) Variable cost

Variable cost since it varies with the level of output so the TVC curve is positively sloped

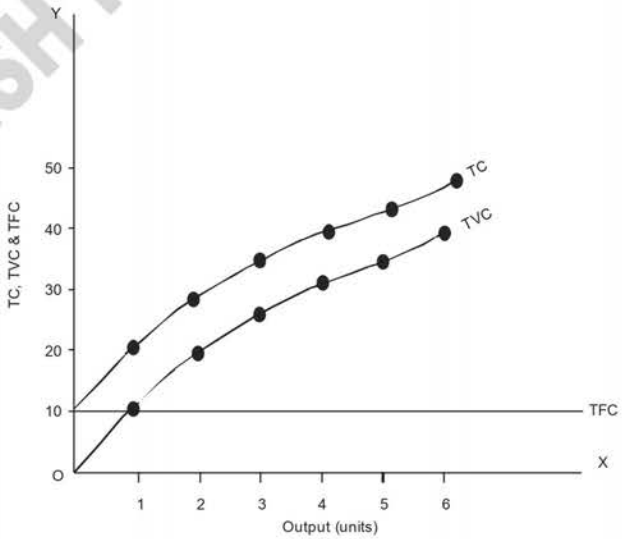
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TVC increases with increase in output. Initially, it increases at decreasing rate (till point A). Eventually it increases at an increasing rate (beyond point A.) It increases at an increasing rate when diminishing return to a factor start operating.

Behaviour of Fixed Cost, Variable Cost and Total Cost

Output	Fixed Cost (₹)	Variable Cost	Total Cost
0	10	0	10
1	10	10	20
2	10	18	28
3	10	24	34
4	10	28	38
5	10	32	42
6	10	38	48



TC = TFC + TVC

- TFC is constant at all levels of output.
- TVC increases as output increases.
- TC is parallel to TVC. It shows that the difference between TC and TVC (=TFC) is constant.

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Total Average Cost (AC)

Cost per unit of output is called average cost.

TAC = $\frac{TC}{Q}$ Here, AC = Average Cost

TC = Total Cost

Q = Quantity of Output

Average cost is the cost per unit of output produced. It is also called unit cost of production.

TC and AC

Output (Units)	TC	AC
0	10	$\frac{10}{0}=\infty$
1	20	$\frac{20}{1}=20$
2	28	$\frac{28}{2}=14$
3	34	$\frac{34}{3}=11\cdot3$
4	38	$\frac{38}{4}=9\cdot5$
5	42	$\frac{42}{5}=8\cdot4$
6	48	$\frac{48}{6}=8$

Fixed and Variable Components of AC

Average cost is the sum total of average fixed cost and average variable cost. i.e.,

$$AC = AFC + AVC \begin{bmatrix} \text{Here, AC= Average Cost} \\ \text{AFC = Average Fixed Cost} \\ \text{AVC = Average variable cost} \end{bmatrix}$$

(i) Average Fixed Cost : Average fixed cost is the fixed cost per unit of output.

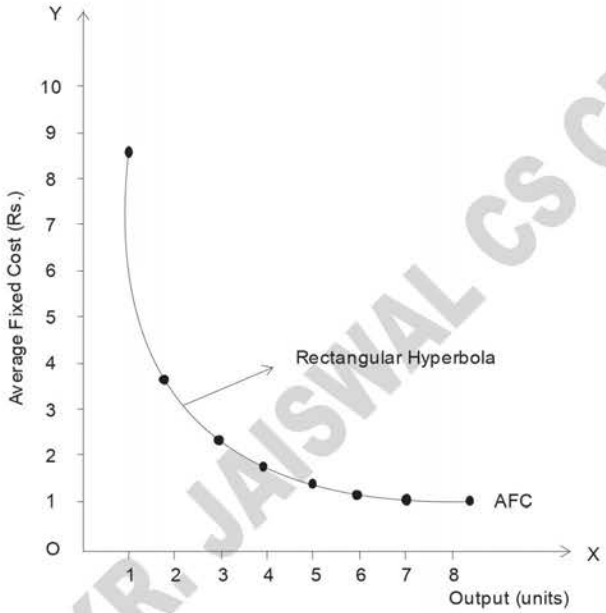
$$AFC = \frac{TFC}{Q} \begin{bmatrix} \text{Here, AFC = Average Fixed Cost} \\ \text{TFC = Tota lFixed Cost} \\ \text{Q = Quantity of Output} \end{bmatrix}$$

Above schedule shows that when one unit is produced, the average fixed cost is ₹10. When 5 units are produced then average fixed cost is ₹2. Average fixed cost goes on diminishing as output increases.

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Average Fixed Cost

Output (Units)	Fixed Cost (₹)	Average Fixed Cost (₹)
1	10	10
2	10	5
3	10	3.3
4	10	2.5
5	10	2
6	10	1.67
7	10	1.42
8	10	1.25



AFC is rectangular hyperbola. It shows:

i. That AFC decreases as output increases.

ii. AFC x Q at any level of output is the same. Because.

AFC x Q = TFC

Which is constant at all levels of output.

Thus: 4 x 2.5 = 10

8 x 1.25 = 10

Average Variable Cost

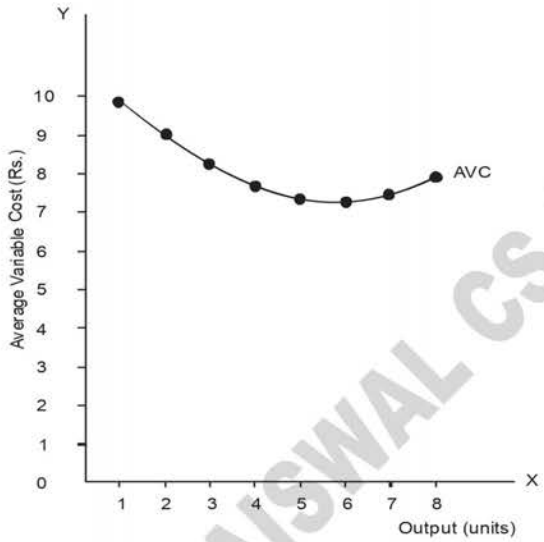
Average cost is the variable cost per unit of output.

$$AVC = \frac{TVC}{Q}\begin{bmatrix}\text{Here, AVC} = \text{AVerage Variable Cost}\\ \text{TVC} = \text{Total Variable Cost}\\ \text{Q} = \text{Quantity of Output}\end{bmatrix}$$

Following schedule and diagram shows that up to sixth units of output, average variable cost falls but from 7th unit it begins to rise. Falling AVC is in accordance with increasing returns to a factor, while rising AVC is in accordance with diminishing returns to a factor.

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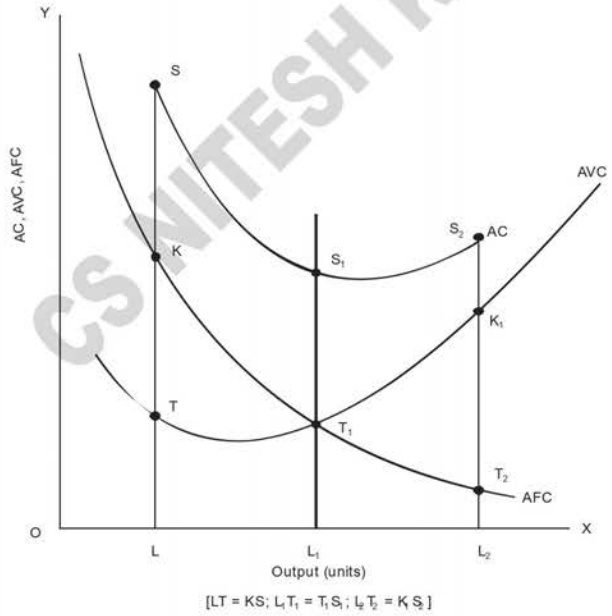
Output (Units)	Variable Cost (₹)	Average Variable Cost (₹)
1	10	10
2	18	9
3	24	8
4	28	7
5	32	6.4
6	38	6.3
7	46	6.6
8	62	7.7



AVC curve is U-shaped

This is in accordance with the law of variable proportions. It falls so long as returns to a factor are increasing. It rises when returns to a factor are decreasing.

AC as the Summation of AFC and AVC: AC curve is a vertical summation of AFC and AVC curves,



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Marginal Cost (MC)

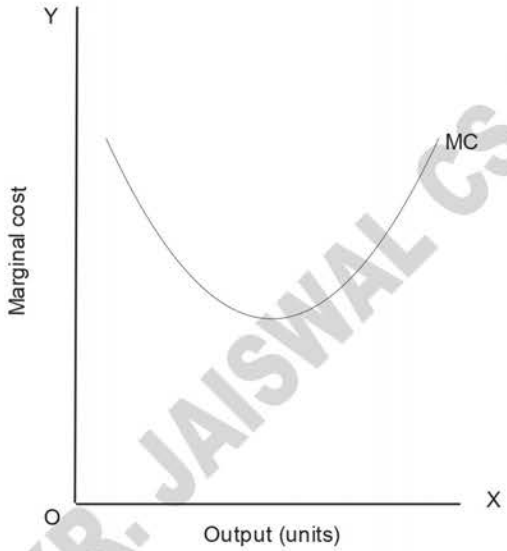
Marginal cost is the change in total cost when an additional unit of output is produced.

Marginal cost is the addition to total cost due to the addition of one units of output.

$$MC_n = TC_n - TC_{n-1} \quad \begin{bmatrix} Here, MC_n = Marginal\ cost'n'units of output \\ TC_n = Total\ cost of'n'units of output \\ TC_{n-1} = Total\ cost of'n-1'units of output \\ \Delta TC = Change\ in\ total\ cost \\ \Delta Q = change in output \end{bmatrix}$$

OR

$$MC = \frac{\Delta TC}{\Delta Q}$$



MC is U-shaped in accordance with the law of variable proportions. Falling MC is in accordance with rising MP when there are increasing returns to a factor. Rising MC is in accordance with falling MP when there are diminishing returns to a factor.

Note:MP and MC are exactly opposite to each other.

Short Period MC can be estimated either form TVC or from TC

MC is an additional cost. Additional cost by definition cannot be fixed cost; it can only variable cost. Therefore, MC can be estimated in either of the following ways:

$$MC_n = TC_n - TC_{n-1}$$

$$Or, MC_n = TVC_n - TVC_{n-1}$$

$$Proof: MC_n = TC_n - TC_{n-1} = (TFC_n + TVC_n) - (TFC_{n-1} + TVC_{n-1})$$

$$(\because TC = TFC + TVC)$$

$$TFC_n + TVC_n - TFC_{n-1} - TVC_{n-1} = TVC_n - TVC_{n-1}$$

$$[TFC_n = TFC_{n-1}, \text{because TFC is constant}]$$

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MC is Variable Cost only

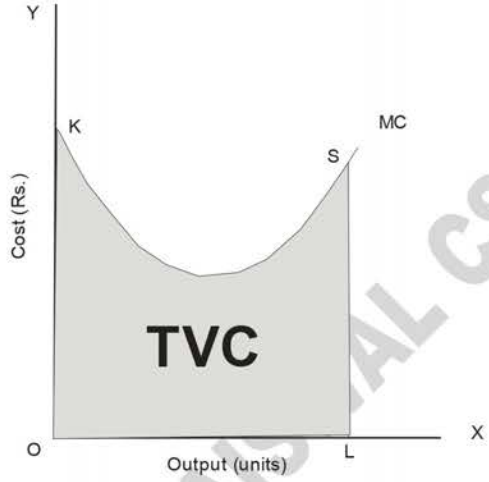
It needs to be emphatically noted that MC is an additional cost (corresponding to an additional unit of output

By definition, additional cost cannot be fixed cost; it can only be variable cost. Accordingly, the sum total of marginal cost corresponding to different units of output (1 to n units) becomes TVC. Thus, $\sum MC = TVC$

Geometrically, total area under MC curve, corresponding to any level of output, measures TVC of that level of output. The fig. shows that for OL level output,

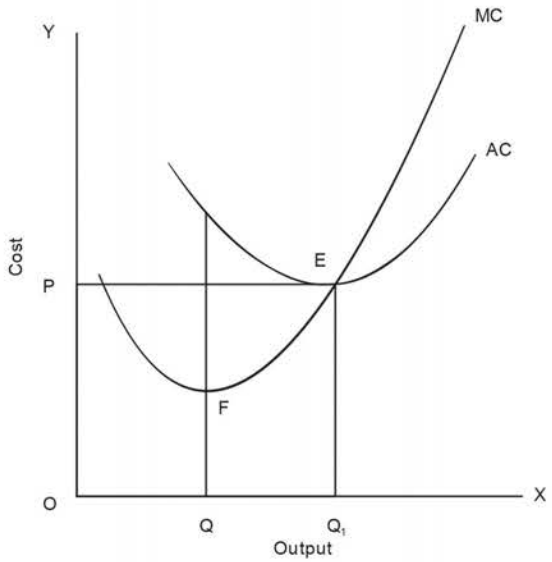
TVC = area OLSK = $\sum MC$

For all units of output between O to L.



- At OL level of output, area under MC = OLSK.
- This is equal to TVC (total variable cost).
- This is because TVC = $\sum MC$.
- Total variable cost is the sum total of marginal cost for each unit of output.

Relation between Average and Marginal Cost



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Note the following observations:

(1) Both AC and MC are calculated from TC.

$$AC = \frac{TC}{Q} \text{ and } MC_n = TC_n - TC_{n-1}$$

▪ **When AC is falling, MC < AC**
▪ **When AC is rising, MC > AC**
▪ **When AC is constant (as at point E), MC = AC**
▪ **MC is always to the left of AC, and cuts AC from its lowest point.**

Relation between Total Cost and Marginal Cost

Following are the principle observations in this regard:

i. Marginal cost is estimated as the difference between total costs of two successive units of output.

ii. Thus,

$$MC_n = TC_n - TC_{n-1}$$

iii. When total cost rises at a diminishing rate, marginal cost should be decreasing.

iv. When the rate of increase in total cost stops diminishing, marginal cost should be at its minimum.

v. When the rate of increase in total cost starts rising, marginal cost should be increasing.

AC, AVC, AFC and MC in one Diagram

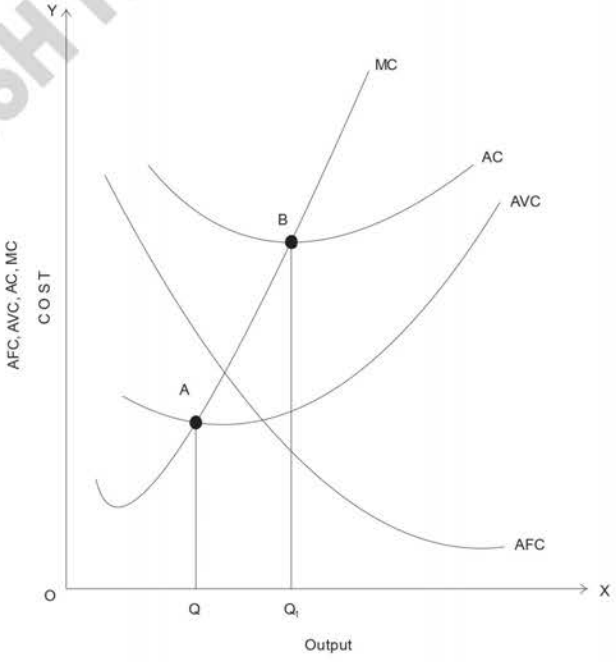
The point to be specifically noted in this figures is that MC curve should be shown cutting both AC and AVC at their lowest points.Also note the following observations:

1. When AC declines, MC decliners faster than AC. So that MC curve remains below AC curve.

2. When AC increases, MC increases faster than AC. SO that MC curve is above AC curve.

3. Since MC declines faster than AC, it reaches its lowest point earlier than AC. SO that MC starts rising even when AC is falling.

4. MC must cut AC from its lowest point.



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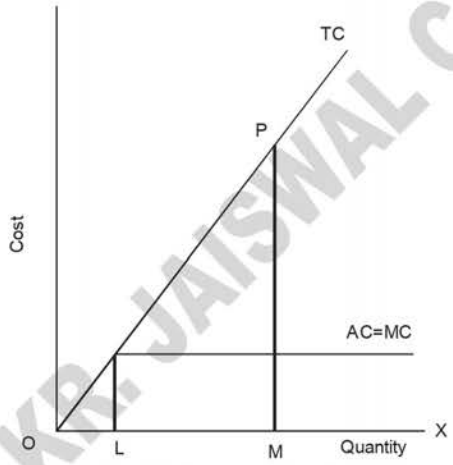
Note: AC and AVC get close to each other as output increases. On the other hand, AC and AFC get away from each other as output increases. This is because, as output increases, the component of AVC in AC tends to increase while the component of AFC in AC tends to decrease. However, at no stage AVC will touch AC because AFC can never be zero even when it continuously declines with increase in output.

Long Run Cost Function

Long run curve establishes functional relationship between production and long run cost of production. Shape of long-run cost curves is generally "U" shaped like short –run cost curves. Long run curves are comparatively flatter than short run cost curves.

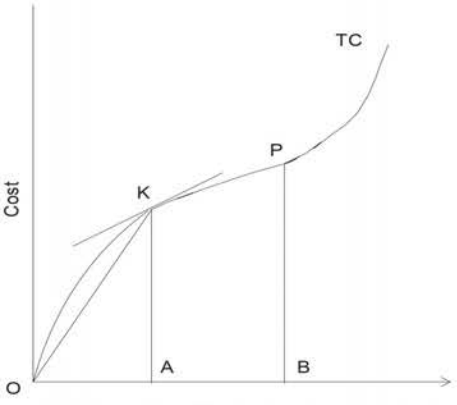
Where productive efficiency is determined by proportion of inputs rather than their absolute quantities, total cost of production is changes in direct proportion to output. Therefore, TC curve is a straight line with a fixed slope and starts from the origin. In this case, both average cost and marginal cost are throughout equal to each other and remain constant.

In the following figure TC curve represents total cost of output of a firm for corresponding quantities of output. Thus, when the output of a firm is OM, total cost is PM, average cost is PM/OM. Marginal cost is also equal to the constant slope of TC curve, that is, PM/OM.



Long Run total, Average and Marginal Costs

Modern economic theory contends that in the long run, a firm experiences varying returns to scale. With an expansion in the scale, it starts with the benefit of increasing returns this is following by constant returns which, in turn, are replaced by diminishing returns.



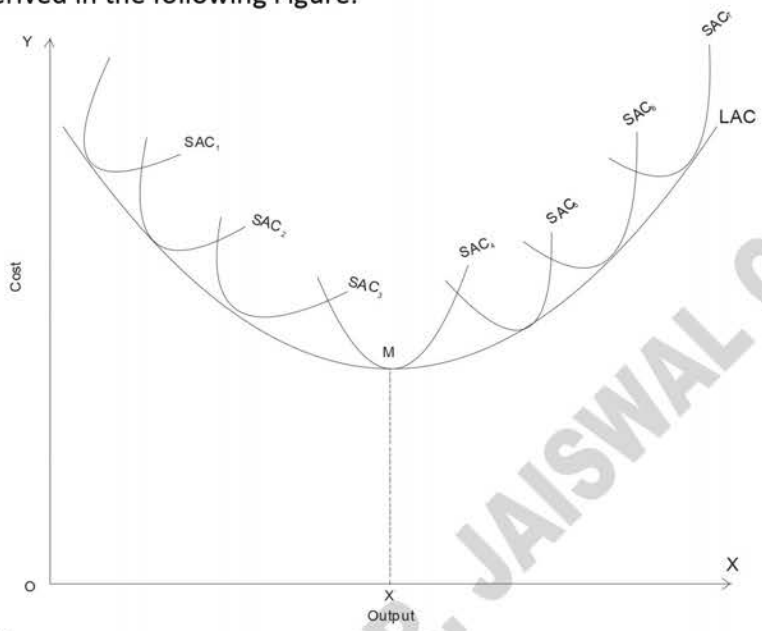
TC, AC and MC with Varying Returns to Scale

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In the above diagram, TC curve starts from the point O, rises at a decreasing till point P. At this output, there are constant returns to scale. When scale of production exceeds OB, diminishing returns set in and total cost curve starts rising at an increasing rate.
At point K, on TC curve, the slope of the line joining it with origin O measures AC and the slope of the tangent to the curve at this point measures MC.

Long – run Average Cost (LAC)

The firm has infinite methods of production available, each represented by a different plant size. Each plant size is represented by a different SAC curve. Each point on the LAC curve has shown the minimum cost per unit for producing the corresponding level of output. LAC is graphically derived in the following Figure.



Where,

LAC = Long-run average cost curve.
SAC = Short-run average cost curve.

LAC is a continuous curve. Each points of LAC correspond to a point on the SAC which is tangent to the LAC at that point. For output levels less than XM the LAC curve is tangent to the SAC curves to the left of their minimum points. For output levels greater than XM the LAC curve is tangent to the SAC curves to the right of their minimum points. At XM level of output, the LAC is tangent to SAC4 at its minimum point, M. Point M is the minimum point of the LAC curve also. The plant size whose costs are denoted by SAC4 is called the optimum scale of plant.

LAC curve is U-shaped. The reason behind the U-shape of the LAC curve is the laws of return to scale. According to this law, as plant size increases, the AC of production decreases due to economies of scale. The economies of scale exist only up to the optimum plat size (SAC4). The turning up of the LAC curve is due to decreasing returns to scale which are intern due to diseconomies of scale.

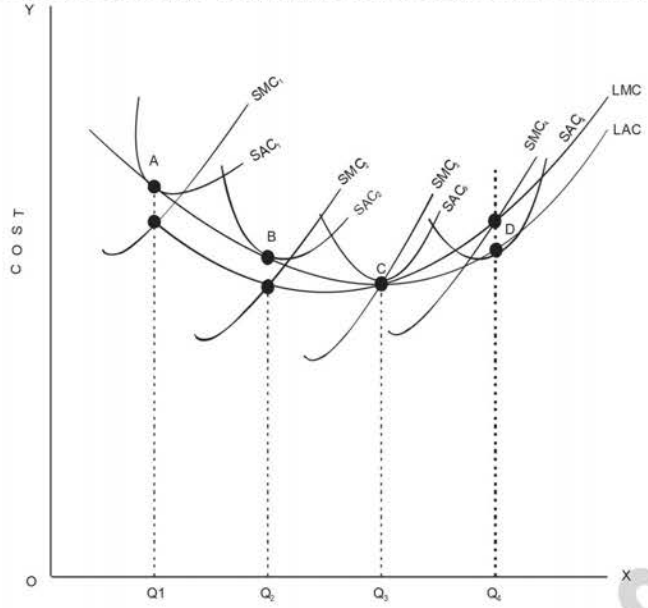
LONG RUN MARGINAL COST (LMC):

LMC can be derived by using following way:

1. First drop perpendicular on the output (horizontal) axis from all those points on LAC where LAC = SAC. In the diagram they are shown AQ_1, BQ_2, CQ_3 and DQ_4 etc.

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2. Locate the points of intersection of these perpendiculars with respective short run marginal cost curves (SMC). These points are shown as A_1, B_1, C, D_1 etc in the diagram
3. Joint these points through minimum of LAC to get LMC curve.



Producer equilibrium refers to a situation when producer is producing a given amount of output with least cost combination of factors. The least cost combination of factors is also known as optimal combination of factors. Least cost combination refers to that combination in which producer is able to achieve either of the following two conditions:
– production of maximum output from a given level of inputs.
– production of a given level of output at minimum cost.
To understand the least cost combination, it is important to know the prices of the inputs and the total expenditure to be incurred by the producer. Based on the budget and the prices, the isocost curve can be drawn.

Isocost Line

Isocost line shows various combinations of two factors of production that firm can buy with given outlays. In other words, isocost line is defined as the locus of various combinations of factors which a firm can buy with a given outlay. The isocost line is also known as the equal cost line or outlay line. As it is assumed that there are only two factors of production. Thus, the total cost incurred on the factors of production for producing a good is the sum of the payments made to labour and capital. Thus, isocost line in equation form can be written as follow:

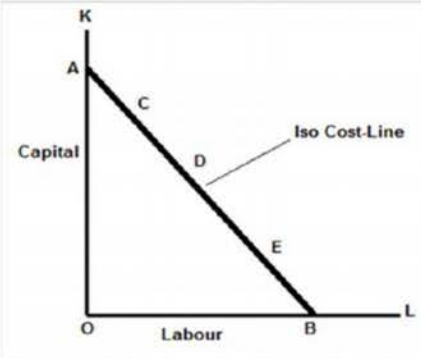
$$C = r.K + w.L$$

Where
C = total cost incurred by the firm on purchasing the quantities of factors used for production.
K = Capital
L = Labour
r= price of capital (or rate of interest on capital)
w= price of labour (or wage rate)

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Shape of isocost curve: Isocostline is the straight line which touches both the axis, that is, x-axis and y-axis.

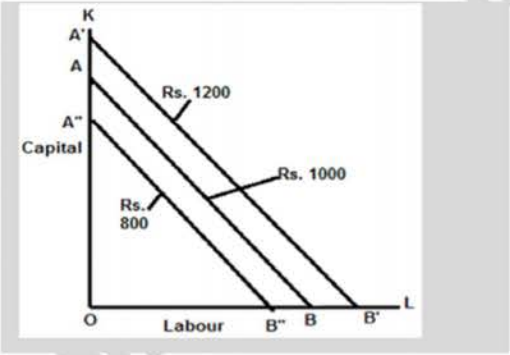
Line AB is the isocostline. Line AB passes through all the combinations of labour and capital which the firm can
buy at given outlay (say Rs. 1000) at given prices of the factors of production.



Slope of the IsoCostline: the slope of the isocost line is the ratio of input prices. In the above units of labour are shown on x-axis and units of capital are on y-axis. The slope of the isocostline would be the ratio of price of labour to price of capital.

Shift in the isocost line: isocostline will shift under two circumstances:

– When prices of the factors remain unchanged but the total expenditure made by the firm will change. Suppose producer wants to increase total spending on the factors of production from Rs. 1000 to 1200 then isocost curve will shift outward. The A'B' is the new iso cost-line. On the other hand if producer wants to reduce total expenditure on the factors of production from Rs. 1000 to 800. As a result, new isocostline A"B" shifted inwards.

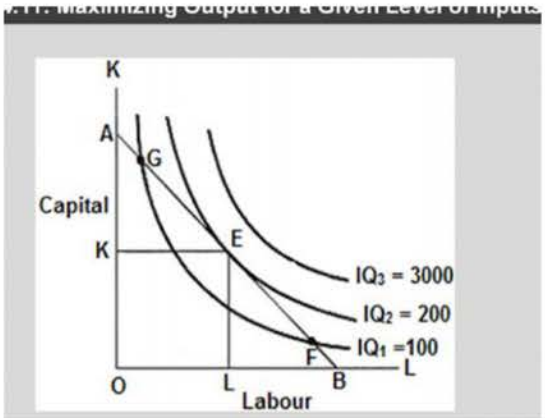


– When expenditure on the factors remains unchanged but the prices of the factor change. Suppose the prices of both the factors decrease proportionately then the real income of the producer will increase which will shift isocost curve outwards. On the other hand when prices of both the factors increases in the same proportion then the isocostline will shift inward.

Least Cost Combination

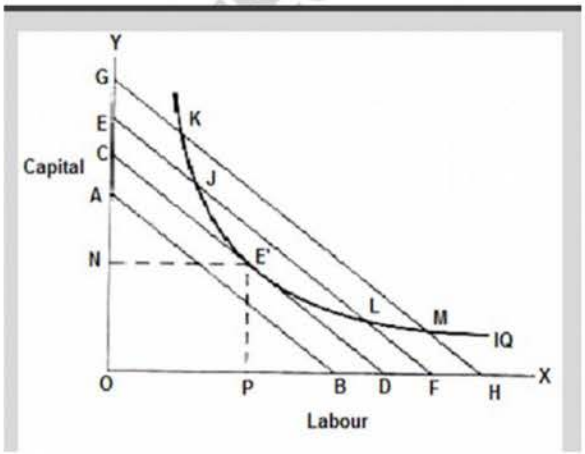
The least cost combination of factors refers to a firm producing the maximum volume of output from a given level of inputs on the one hand and on the other hand a firm produces a given level of output with the minimum cost when the factors are combined in an optimum manner.

Case 1: Maximization of output for a given cost: in this part, an attempt is made to explain the case when cost is given and objective of the producer is to maximize his output. Suppose the total given outlay is C and theprices of capital and labour are Pk and PL. The figure below presents the case of maximizing output for a given level of inputs.



– AB is the isocostline represents the given cost outlay at given prices of capital (Pk) and labour (PL).
– IQ1, IQ2 and IQ3 are the three isoquants representing three different levels of output.
– It is important to note that with given amount of labour and capital, a business firm can produce any output level in the area OAB. It requires additional resources to produce any output level outside this area. Hence, IQ3 level of output is not possible to attain as given level of labour and capital is not sufficient to produce that level of output.
– In this case, produce wants to reach the isoquant which provides the maximum level of output. In this case, the consumer can produce maximum output at point E on isoquant IQ2. Thus, point E is the producer equilibrium point as it satisfied both the conditions for producer equilibrium.
– At point E the slope of the isocostline (w/r) is equal to the slope of the isoquant (MPL/MPL). This is the first condition for equilibrium.
– Second condition of equilibrium is that, the isoquant must be convex to the origin.

Case 2: Minimizing Cost for a Given Level of Output: in this case the level of output is given and the objective of the producer is to minimize the cost to produce given level of output. The conditions of equilibrium of the firm remain same, that is, slope of isoquant must be equal to slope of isocostline and the firm minimizes its cost by employing the combination of labour and capital determined by the point of tangency of the isoquant with the lowest isocostline. In figure belw E' is the least cost combination point.



At point E', both the conditions for equilibrium are satisfied.
– Point below E' is desirable because they show the least-cost combination but it is not attainable to produce output represent by isoquant IQ. Point above to E' show higher costs. Thus point E' is only optimal combination point of factor which produces given output at lowest possible cost.

some basic concepts of Costs need to be discussed whichdo not change under short and long run.
– **Accounting Cost:** Accounting costs are the cash payments which a firm makes to other factor owners for purchasing and hiring for various factors of production. It is also called as explicit costs. When a business firm starts production of a good, firm has to pay prices for the factors used in the production process. For instance, a firm pays wages to the labourers employed, prices for the raw material, rent for place and building it hired for production and rate of interest on money borrowed for business. An accountant will take into account all the direct payments made by the business firm.
– **Economic Costs:** in addition to all these accounting costs, economic costs take in account the all the implicit costs which the entrepreneur could have earned if he would have invested his own money and sold his own services in the next best alternative uses. For instance, if an entrepreneur invests his certain amount of money in his own business would have invested somewhere else then he would have earned certain amount of rate of interest or dividends. Similarly, instead of working in his own business if he would have render his managerial and entrepreneurial services somewhere else he would have earned some amount of money. Thus, economist includes all these cost as implicit costs in the cost of production.
Hence, economic costs take in account both the direct and indirect costs.

Economic costs = Accounting Costs + Implicit Costs

Opportunity Cost: Opportunity cost is the cost of any next best alternative use that is sacrificed. Suppose a piece of land can be used to grow both wheat and gram. If a farmer uses that piece of land only to grow wheat then he sacrifices the production of gram.
– Opportunity cost for a firm of using resources in the production of one good is the revenue foregone by not using these resources in their next best alternative. Suppose the factors of production which a firm used for the production of good X may also be used for the production of good Y. Thus, the opportunity cost of production of good X is the foregone revenue which a firm would have earned from the production of good Y.
Private Cost: Private cost is the cost made by a firm for manufacturing a commodity. It is the sum of bothexplicit cost and implicit cost as a business firm takes into account all these cost while making both production decision and decision about prices of the product it has manufactured.
Social Cost: it is the cost to the society of an economic activity. In other words, social cost is the sum of the private cost and the net of negative externalities over positive externalities.
– The production of a commodity caused benefits and some loss to the society including the depletion of depletion of air quality due to high pollution, and other negative externalities generated by the manufacturing firm for a particular locality or for the society as a whole. A manufacturing firm does not take into account these costs while making decisions regarding the prices and output of a product.

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These externalities caused by the production of a firm to other constitute a part of social cost which abusiness firm completely ignores in any business decision but may be greater significance for the social point of view.

– For instance, a pesticide producing firm creates some negative externalities while producing pesticides which include foul smell, polluted air and effluents that are emitted as part of production of pesticides. These caused economic damage to the society in various forms including health problems to the people who live in the adjoining areas. These harmful effects are known as negative externalities.

– The beneficial effects caused by the production of a particular commodity are known as positive externalities.

Economies of scale

The term economies of scale denotes saving in cost of production with an increase in the scale of output or thesize of the plant. It should be noted that the existence of economies does not mean a reduction in total cost inabsolute terms. It only means a reduction in relative terms and manifests itself in a reduction in average cost ofoutput. Similarly, the term diseconomies refer to an increase in average cost of output when the plant size isincreased.

Economies and Diseconomies of Scale are broadly divided into two categories;

– Internal economies and diseconomies of scale

– External economies and diseconomies of scale

Internal Economies of Scale

Internal economies of scale are associated with the expansion of the scale of output of the firm; they are derivedindirectly as a result of expansion of the industry to which it belongs. Listed below are some of the leadingsources of such economies.

Managerial Economies: These economies arise on account of the scope of employing better qualified and trained managers and other employees who are able to take quicker and more profitable decisions. In addition, management experts are exploring new methods of improving the management of the firm and reducing its costof operations.

Financial Economies: It is a common knowledge that most firms have to depend upon borrowed funds. Thelenders, while deciding the rate of interest to be charged on their loans, give due importance to the'creditworthiness' of the borrower. And other things being equal, bigger firms enjoy greater creditworthinessthan the smaller one. Accordingly, they are able to borrow funds at lower interest rates. For the same reason,they have also the option of raising additional sources through equity capital.

Technical Economies: With an increase in the scale of output, the choice of inputs and their varieties becomeswider for the firm. It can go in for those machines and equipment etc. which have a higher marginal productivityas compared with their cost. In other words, it is possible to get a larger output per unit of cost incurred on them.

Bye-Products: An increase in the scale of output also generates bigger flows of wastes. When the scale issmall, the firm is not able to use these products for additional earnings. However, when the generation of wastecrosses a critical limit, it often becomes possible for the firm to produce certain bye-products or sell off the wasteto other firms and thus add to its income.

Better Utilization of Inputs: Various inputs, particularly machines and equipment are lumpy and indivisible.They also require time intervals for 'maintenance' and 'servicing' etc. Any one of them can go out of order andrequire repairs. If a machine goes out of order, or is otherwise not able to operate, then a firm with a small scale

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is not able to find its substitute and its production suffers. For example, if a transport company has only one truckand that needs some repair, its employees are left unemployed for the time being, though the firm has to paythem all the while. In contrast, a firm with a bigger scale is able to adjust the availability of its machinery,equipment and employees etc. in such a manner that the 'downtime' of various inputs is adequately taken careof.

Economies of Inventories: A bigger-size firm is in a better position to adjust its stocks of inputs and finishedproducts etc. in such a manner that the normal discrepancy between flows of production and sales are ironedout.

Marketing Economies: A large firm also reaps the advantages of buying and selling in bulk. As a result, it isable to procure its inputs at concessional prices. Similarly, on account of bulk selling, its average selling costscome down. It can also have separate sales and marketing departments which can undertake the job of marketingits product in a professional manner. In addition, its sheer size imparts it better bargaining strength.

Advertising: When a firm is not operating under conditions of perfect competition, it is obliged to undertake various activities to promote its sales of which advertising happens to be an integral part. It is found that a small firm is not able to afford advertising because it has to be repetitive to be successful. Moreover, with an increase in the advertising budget, a firm is able to diversify its programme so as to cover more effective media and in an optimum proportion. As a result, its per unit advertising expenses come down.

Risk Economies: A large firm can diversify its product lines and thereby reduce the average risk faced by it since all product lines are not likely to generate losses simultaneously. The firm can compensate its losses from some lines with profits from the others. A large firm has also better command over resources compared with a small firm.

Internal Diseconomies of Scale

In the long run, a number of factors may cause an addition to average cost of a firm. These sources of diseconomies are directly or indirectly linked to the inability of the problems of management which not only crop up when a firm is started, but keep increasing with its size Chamberlin terms them 'Complexities of Management'. Briefly these are as follows:

Limits of Entrepreneurship: A firm, by definition, can have only one unit of entrepreneurship though it can have a large number of units of every other input. Moreover, entrepreneurship, in the ultimate analysis, manifests itself in the form of decision-making human beings who have to bear the consequences of their decisions. Therefore, the willingness to take risk varies between individual entrepreneurs and between different situations. Very frequently, wrong or sub-optimal decisions are taken which result in avoidable costs. Similarly, with an increase in the size of the firm and its activities and departments, the entrepreneurship has to institute a system of delegating responsibility of assessing the ever-changing situation and taking on the spot decisions. It has also to set up an effective monitoring system. All this adds to the operating costs of the firm. In addition, it is found that on account of increase in the size of the firm, a number of additional departments may become necessary (such as a department which maintains leave accounts of the staff). As the administrative set up expands, delays set in and a number of avoidable expenses have to be undertaken.

Managerial Autonomy: With increasing size of the firm, various managerial wings (such as technical, financial, sales, marketing and others) have to be given sufficient autonomy of decision-making. The managers heading these departments, however, do not have a direct personal stake in the success of the firm. In addition, problems of coordination between various departments of the firm have to be tackled. The net result is often diseconomies of scale.

X- inefficiency: It is argued that the traditional theory is wrong in assuming that a firm always uses its resourcesin the best possible manner. This is because, in practice, most of the ground

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level decisions are taken by individual managers and other employees of the firm. And their motivation is advancement of their own careers rather than optimizing the performance of the firm. Quite frequently, they also lack adequate incentive to do their best. Unless there is a very sound system of 'reward and punishment' for each employee, their performance is likely to lack necessary motivation.

External Economies of Scale

These economies are those which are reaped by a firm not on account of its own efforts and increase in its scalebut on account of the expansion and growth of the industry to which it belongs and also on account of overall development of the economy and markets.

Some of the major sources of these economies are as under:

Economies of Information: Availability of information is cheaper when we consider the industry as a whole. A firm requires continuous information regarding the prices of inputs and its product, as also likely changes in them on account of shifts in government policies and other developments. If the industry as a whole sets up facilities for providing information through various means of communication, it is much cheaper, than if it is done by the firm alone. As a result, when the authorities or the industry as a whole provides means of information, it becomes economical for the firm to use the same sets up.

Research and Development: The results of research undertaken by the authorities or by the industry as a whole are economical for the firm to use. Also, it is generally commercially viable for a research organization toundertake research on its own and sell the findings to individual firms on payment basis than for the firms toundertake the same individually.

Economies of Concentration: When an industry is concentrated in a certain locality or region, its firms get incidental saving in costs in the form of cheaper and more reliable services. These services cover, for example, repairs, consultancy, banking, credit, insurance, financial advice, packing, transport, housing, communication, ,training, housing, health care, and so on. An individual firm is able to make use of these services at competitive and economical prices.

Economies of Specialization: When a number of associated and interlinked industries get located in the neighborhood, they all provide support to each other and their costs come down. As a result, the individual firms also benefit from this development.

External Diseconomies of Scale

As in the case of external economies, external diseconomies of scale are thrust upon a firm by extraneous forces. They are not directly related to the growth in the size of the firm under consideration. There are several reasons for the prices of inputs to move up or their quality to deteriorate. For example, the authorities may impose a tax on one or more inputs. Or there may be a wage revision in the industry or imposed by the authorities on the economy as a whole.

Similarly, it is also possible that prices of some imported inputs may go up because of one or more reasons including for example, customs duties imposed by the domestic government or by the exporting country or increase in cost of production abroad, etc.

It is possible that on account of war, strikes, some natural calamity, or quantitative restrictions imposed by domestic country or a foreign country, the availability of an essential input may become costlier or insufficient.

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SUMMARY

Production-- Production is an important economic activity. Satisfaction of human wants is the objective of production using factors of production namely; Land, Labour, Capital and Entrepreneurship.

– Theory of production studies the economic process of converting inputs into outputs, given the state of technology. It provides a basis for analysis of relation between costs and amount of output.

– The production function is a technical relation connects factor inputs and output. It describes the laws of proportion, that is, the transformation of factor inputs into products (outputs) at any particular time period.

– Which one method would be chosen by the firm at any particular point of time will depend on the prices of factors of production.

– A technically efficient method of production is not necessarily economically efficient. There is a difference in technical and economic efficient method.

– An isoquant can be of four different shapes:
– Linear isoquant
– Kinked Isoquant
– Input-output isoquant
– Convex Isoquant

– There are two types of production function which we will discuss under theory of production:
– Short Run Production Function
– Long Run Production Function.

– The law of variable proportion shows the production function with one input factor variable while keeping the other input factors constant. It is a short run concept. The law of variable proportion is the modern approach to the 'Law of Diminishing Returns (or The Laws of Returns).

– Three types of returns to a factor
– Increasing returns to scale
– Diminishing Returns to Scale
– Negative Negative Returns to Scale

– Law of Returns to Scale is a long run phenomenon. In the long run, all factors of production become variable. Alternatively, no factor of production is fixed in the long run. Thus, the firm is able to alter its stock of inputs in long run by increasing all the factors of production which is not the case with one variable factor. When all factors are changed in some proportion, the behaviour of output is analyzed with the help of laws of returns to scale.

– Least cost combination: Least cost combination refers to that combination in which consumer has to achieve either of the following two conditions:

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– To produce maximum output from a given level of inputs.
– To produce a given level of output at minimum cost.

– Accounting Cost: Accounting costs are the cash payments which a firm makes to other factor owners for purchasing and hiring for various factors of production. It is also called as explicit costs.

– Economic Costs: in addition to all these accounting costs, economic costs take in account the all the implicit costs which the entrepreneur could have earned if he would have invested his own money and sold his own services in the next best alternative uses.

– Opportunity Cost: Opportunity cost is the cost of any next best alternative use that is sacrificed. Suppose a piece of land can be used to grow both wheat and gram. If a farmer uses that piece of land only to grow wheat then he sacrifices the production of gram.

– Social cost is the sum of the private cost and the net of negative externalities over positive externalities.

– Short-Run Costs:
– Fixed Cost
– Variable Cost

– In the short run, there are three types of average costs:
– Average fixed cost **Production** A firm needs various types of inputs which are known as 'Factors of Production',
'Agents of Production', 'Productive Resources' or sometimes even 'Productive Services'. In economics, the factors of production are divided into four categories:

(b) Land, (ii) Labour, (iii) Capital and (iv) Entrepreneurship.

IMPORTANT TERMS

Fixed inputs Fixed inputs, in economic sense, are one whose supply is inelastic in the shortrun and therefore they are used in a fixed quantity in the short-run.

Variable Factors Variable factors, in economic sense, are defined as one whose supply in the short-run is elastic.
Isoquant An isoquant is the locus of all the combinations of factors of production which produces a given level of output. Alternatively, an isoquant includes all the technical efficient method of production which produces a given level of output.
The production isoquant can be of different shapes depending upon the degree of substitutability of factors of production.

Total Product It refers to the total amount of goods and services produced by a manufacturer with given amount of inputs and keeping other factors remains constant.

Marginal Product It represents the successive increase in the total output due to the additional units of variable factor

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Average Product Average product of a factor is the total output produced per unit of the factor employed. It can be obtained by dividing the total output by the total units of factor employed.

Short run Short run refers to a period of time in which quantities of one or more factors of production cannot be changed.

Long run Long run is defined as that time period over which a firm can vary quantities of all factors of production and therefore, can switch between different scales. In the long run production function all inputs are variable.

Returns to Scale Law of Returns to Scale is a long run phenomenon. No factor of production is fixed in the long run. Thus, the firm is able to alter its stock of inputs in long run by increasing all the factors of production which is not the case with one variable factor.

Least cost combination The least cost combination of factors refers to a firm producing the maximum volume of output from a given level of inputs on the one hand and on the other hand a firm produces a given level of output with the minimum cost when the factors are combined in an optimum manner.

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Private Cost Private cost is the cost made by a firm for manufacturing a commodity. It is the sum of both explicit cost and implicit cost as a business firm takes into account all these cost while making both production decision and decision about prices of the product it has manufactured.

Cost Function A firm's cost function is the functional relationship between its output and its cost. Cost function is a determined by the production function of the firm and the prices it pays for different inputs. Hence, the theory of production forms the basis of the theory of cost.

Long-Run Costs In the long-run all costs become variable. It means that in the long-run, a firm can hire more quantity of both capital and labour, more of raw materials and other inputs, while technology remains constant.

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Internal Economies of Scale Internal economies of scale are associated with the expansion of the scale of output of the firm; they are derived indirectly as a result of expansion of the industry to which it belongs.

Internal Diseconomiesof scale In the long run, a number of factors may cause an addition to average cost of a firm. These sources of diseconomies are directly or indirectly linked to the inability of the problems of management.

External Economies of scale These economies are those which are reaped by a firm not on account of own efforts and increase in its scale but on account of the expansion andgrowth of the industry to which it belongs and also on account of overall development of the economy and markets. Relationship between cost and output, that is, how costs of production changes with changes in

OBJECTIVE QUESTIONS

1. _____ Shows the overall output generated at a given level of input:

(a) Cost function
(b) Production function
(c) Iso cost
(d) Marginal rate of technical substitution

2. IfLAC curve falls as output expands, this is due to _____.

(a) Law of diminishing retains
(b) Economics of scale
(c) Law of variable proportion
(d) Dis economics of scale

3. Isoquants are equal to :

(a) Production Lines
(b) Total utility lines
(c) Cost lines
(d) Revenue lines

4. The marginal product curve is above the average product curve when the average product is:

(a) Increasing
(b) Decreasing
(c) Constant
(d) None

5. Increasing returns to scale can be explained in terms of:

(a) External and internal economies
(b) External and internal dis economies
(c) External economics and internal dis economies
(d) All of these

6. An isoquant is _____ to an iso cost line at equilibrium point:

(a) Convex
(b) Concave
(c) Tangent
(d) Perpendicular

7. At the point of inflexion, the marginal product is:

(a) Increasing
(b) Decreasing
(c) Maximum
(d) Negative

8. Diminishing marginal returns implies:

(a) Decreasing average variable costs
(b) Decreasing marginal costs
(c) Increasing marginal costs
(d) Decreasing average fixed costs

9. If the marginal product of labor is below the average product of labour. It must be true that:

(a) Marginal product of labour is negative
(b) Marginal product of labour is zero
(c) Average product of labour is falling
(d) Average product of labour is negative

10. Law of variable proportion is valid when:

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(a) Only one input is fixed and all other inputs are kept variable
(b) All factors are kept constant
(c) All inputs are varies in the same proportion
(d) None of these

11. Change in total revenue due to incremental change in quantity supplied is called :

(a) Marginal revenue
(b) Marginal revenue
(c) Average Revenue
(d) Average change

12. Increase in all input leading to less than proportion increase in output is called _____:

(a) Increasing returns to scale
(b) Decreasing returns to scale
(c) Constant returns to scale
(d) Both increasing and decreasing returns to scale

13. If distance between isoquant increases

(a) Increasing returns of scale
(b) Diminishing returns to scale
(c) Constant returns of scale
(d) Increasing returns initially, following by decreasing returns to scale.

14. During IInd stage of law of Diminishing returns:

(a) MP and TP is maximum
(b) MP and AP are decreasing
(c) AP is negative
(d) TP is negative

15. TP is increasing till

(a) MP is +ve
(b) MP is zero
(c) MP is -ve
(d) ALL THE ABOVE

16. Who gave the concept of innovative Entrepreneurship?

(a) Robbins
(b) Adam Smith
(c) Schumpeter
(d) Sweezy

17. At 10 unitsTotal cost- ₹200; 20 unitsTotal cost – ₹600, what is marginal cost=?
(a) 50
(b) 40
(c) 30
(d) 400

18. Average Fixed Cost = ₹20; Quantity Produced = 10 units; What will be the Marginal cost of 20^{th} unit?
(a) ₹10
(b) ₹20
(c) ₹5
(d) None

19. What is Production in Economics:-

(a) Creation / Addition of Utility
(b) Production of food grains
(c) Creation of services
(d) Manufacturing of goods

20. External Economies of Scale are obtained by

(a) a firm
(b) a group of firm
(c) small production
(d) Society

21. If a firm' output is zero, then

(a) AFC will be positive
(b) AVC will be zero
(c) Both of (a) and (b)
(d) None of (a) and (b)

22. Functions of the entrepreneur are:

(a) Risk bearing
(b) Initiating a business enterprise and resource co-ordinating
(c) Introduction mew innovations
(d) All of the these

23. Law of diminishing returns is applicable in :

(a) Manufacturing industry
(b) Agriculture
(c) Neither (a) nor (b)
(d) Any economic activity at a point of time

24. Labour force wants more _____.

(a) Facility
(b) Leisure
(c) Benefit
(d) All of the above

25. Production activity in the short run is analysed by

(a) Returns to scale
(b) Economies of scale

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(c) Law of variable proportion
(d) None of these

26. Increasing returns to scale occurs due to :

(a) Economies of scale
(b) Specialization
(c) Indivisibility of factors
(d) All of these

27. Law of diminishing returns is applicable in ___

(a) Only manufacturing industries
(b) Only agriculture
(c) Neither in agriculture nor in industries.
(d) In all economic activities after a limit

28. Law of increasing returns is applicable because of _____

(a) Indivisibility of factors
(b) Specialization
(c) Economics of scale
(d) Both b and c

29. When output decreases by 20% due to increase in inputs by 20% this stage is called the law of _____.

(a) Increasing returns to scale
(b) Decreasing returns scale
(c) Constant returns to scale
(d) None of these

30. In the first stage of law of variable proportion, total product increases at the _____

(a) Decreasing rate
(b) Increasing rate
(c) Constant rate
(d) Both A and B

31. What will be the total product when two labourers are hired according to the table given Below.

No of Labourers	Total product	Marginal product
0	-	-
1	350	350
2	-	230

(a) 680
(b) 580
(c) 350
(d) 230

32. Which function shows relationship between input and output?

(a) Consumption function
(b) Investment function
(c) Production function
(d) cost function

33. External economics are enjoyed:

(a) By large producers only
(b) As firm expands
(c) Both (a) and (b)
(d) None of above

34. Opportunity cost is :

(a) Direct cost
(b) Total cost
(c) Accounting cost
(d) Cost of foregone opportunity

35. As output increases, average fixed cost:

(a) Remains constant
(b) Starts falling
(c) Start rising
(d) None

36. Average fixed cost can be obtained through:

(a) $AFC = \frac{TFC}{TS}$
(b) $AFC = \frac{EC}{TU}$
(c) $AFC = \frac{TC}{PC}$
(d) $AFC = \frac{TFC}{TU}$

37. AFC curve is:

(a) Convex & downward sloping
(b) Concave & downward sloping
(c) Concave & upward sloping
(d) Concave & upward rising

38. A firm's average fixed cost is ₹20 at 6 units of output what will it be at 4 units of output?

(a) ₹60
(b) ₹30
(c) ₹40
(d) ₹20

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39. U- shaped average cost curve is based on:

(a) Law of increasing cost
(b) Law of decreasing cost
(c) Law of constant returns to scale
(d) Law of variable proportions

40. When shape of average cost curve is upward, marginal cost:

(a) Must be decreasing
(b) Must be constant
(c) Must be rising
(d) Any of these

41. If total cost at 10 units is ₹600 and ₹640 for 11^{th} unit. The marginal cost of 11^{th} unit is:

(a) ₹20
(b) ₹30
(c) ₹40
(d) ₹50

42. Economic cost includes:

(a) Accounting cost + explicit cost
(b) Accounting cost + Implicit cost
(c) Explicit cost + Implicit cost
(d) Accounting cost

43. Which of the following cost curves is never 'U' shaped?

(a) Average cost curve
(b) Marginal cost curve
(c) Total cost curve
(d) Fixed cost curve

44. Suppose, the total economic cost of production of commodity X is ₹1,25,000.What will be explicit cost of commodity X if implicit cost is 50000.

(a) 90,000
(b) 75,000
(c) 60,000
(d) 1,00,000

45. What is the total cost of production of 20 units, if fixed cost is ₹5,000 and variable cost is ₹2/ per unit.

(a) 5400
(b) 5040
(c) 4960
(d) 5020

46. External economies accrue due to _____:

(a) Increasing returns to scale
(b) Increasing returns of factor
(c) Law of variable proportion
(d) Low cost

47. At which point does the marginal cost curve intersect the average cost curve?

(a) At equilibrium points
(b) At the lowest point of AC
(c) At their optimum points
(d) They don't intersect at all

48. Implicit cost may be defined as the:

(a) Costs which do not change over a period of time
(b) Costs which the firm incurs but doesn't disclose
(c) Payment to the non-owners of the firm for the resources
(d) Money payment which the self employed resources could have earned in their best alternative employment

49. A firm's average fixed cost is ₹40 at 12 units. What will be the average fixed cost at 8 units:

(a) ₹60
(b) ₹70
(c) ₹90
(d) ₹80

50. Returns to scale will and to be in operation when quantity of:

(a) All inputs are changed
(b) All inputs are changed in already established proportion
(c) All inputs are not changed
(d) One input is changed while quantity of all other inputs remain the same

51. Whichof the following curves never touch any axis but is downward?

(a) Marginal cost curve
(b) Total cost curve
(c) Average fixed cost curve
(d) Average variable cost curve

52. Which of the following is known as Envelope curve?

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(a) MC curve
(b) AFC curve
(c) LAC curve
(d) TFC curve

53. A firm producing 7 units of output has an average total cost of ₹150 and has to pay ₹350 to its fixed factors of production. How much of the average total cost is made up of variable cost?

(a) ₹200
(b) ₹50
(c) ₹300
(d) ₹100

54. A firm's average fixed cost is ₹20 at 6 units of output. What will it be at 3 units of output?

(a) ₹60
(b) ₹30
(c) ₹40
(d) ₹20

55. Calculate total cost of 4 units when AFC is 200 and AVC is 50

(a) 140
(b) 120
(c) 50
(d) 1000

56. When total cost at zero level is 300 then AFC at 3 units at

(a) 100
(b) 30
(c) 65
(d) 60

57. Long run does not have:

(a) Average cost
(b) Total cost
(c) Fixed cost
(d) Variable cost

58. Find out the average variable cost of 10 units if it is 20 for 20 units.

(a) ₹40
(b) ₹20
(c) ₹200
(d) ₹400

59. The total cost incurred for 10 units is ₹400 and 20 units is ₹800. Find the marginal cost per unit.

(a) ₹400
(b) ₹40
(c) ₹200
(d) ₹20

60. Which one of the following is correct?

(a) AFC = AVC + ATC
(b) ATC = AFC – AVC
(c) AVC = AFC + ATC
(d) AFC = ATC – AVC

61. Calculate AFC of 3 units from the following data:

Unit	0	1	2	3
Total cost	30	40	50	60

(a) 30
(b) 15
(c) 10
(d) 5

62. Find AFC of 3 units:

Output	0	1	2	3
Total Cost	15	25	35	45

(a) 5
(b) 10
(c) 15
(d) 20

63. What will be the TVC if we produce 2 units?

Unit	0	1	2
Total cost	20	37	50

(a) 15
(b) 05
(c) 17
(d) 30

64. The total cost of production of 10 units is ₹200. When production is increased to 20 units its total cost becomes ₹600. what will be its marginal cost.

(a) 400
(b) 40
(c) 4
(d) 30

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65. Payment made to outsiders for their goods and service are called.

(a) Opportunity
(b) Real cost
(c) Explicit cost
(d) Implicit cost

66. Direct cost is also Known as:

(a) Indirect cost
(b) Traceable cost
(c) Opportunity cost
(d) Accounting cost

67. A firm's AFC is ₹200 at 10 units of output what will be it at 20 units of output?

(a) 500
(b) 100
(c) 150
(d) 200

68. Long run price is also called by the name of _____.

(a) Market price
(b) Normal price
(c) Administered price
(d) Wholesale price

69. What will be the AFC of 2 units according to the table given below:

Output	0	1	2
Total Cost (in ₹)	580	689	850

(a) 235
(b) 135
(c) 235
(d) 290

70. Fixed cost is known as _____ cost.

(a) Prime
(b) Supplementary
(c) Overhead
(d) Direct

71. Average Revenue Curve is also known as _____

(a) Profit Curve.
(b) Demand Curve
(c) Supply Curve
(d) Average cost curve

72. Supply curve remaining unchanged. An increase in demand will lead to .

(a) A fall in price
(b) A rise in price
(c) No change in price
(d) An increase in supply

73. Find out AFC of 3 units:

Unit	0	1	2	3
TC	300	1,000	2,000	3,000

(a) 100
(b) 200
(c) 300
(d) 400

74.

Unit	0	1	3
TC	580	1,200	1,500

Calculate AFC at 2nd unit of output

(a) 235
(b) 290
(c) 310
(d) 920

75. In the long run all factors are-

(a) Fixed
(b) Variable
(c) All factors remain unchanged
(d) None

76. Which of the following curve is not U shaped?

(a) AFC
(b) AVC
(c) MC
(d) TC

77. What will be the AFC of 3 units of Output as per table given below?

Output	0	1	2	3
Total cost (in ₹)	300	1,000	2,500	3,000

(a) 100
(b) 1,000
(c) 200
(d) 400

78. which of the following is known as Envelop Curve?

(a) Average variable cost curve
(b) Average total cost curve
(c) Long run average cost curve
(d) Short run average cost curve

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79. The average fixed cost for producing an output of 6 units of a product by a firm is rs.30. The same cost for producing an output of 4 units will be ₹_____.

(a) 50
(b) 45
(c) 25
(d) 20

80. Given

Output	0	4	8
Total cost	20	24	48

Find average variable cost of 4 unit

(a) 1
(b) 3
(c) 4
(d) 5

ANSWERS

1	(b)	**2**	(b)	**3**	(a)	**4**	(a)	**5**	(a)	**6**	(c)	**7**	(c)
8	(c)	**9**	(c)	**10**	(a)	**11**	(a)	**12**	(b)	**13**	(a)	**14**	(b)
15	(a)	**16**	(c)	**17**	(d)	**18**	(d)	**19**	(a)	**20**	(b)	**21**	(c)
22	(d)	**23**	(d)	**24**	(d)	**25**	(c)	**26**	(d)	**27**	(d)	**28**	(d)
29	(c)	**30**	(b)	**31**	(b)	**32**	(c)	**33**	(c)	**34**	(d)	**35**	(b)
36	(a)	**37**	(a)	**38**	(b)	**39**	(d)	**40**	(c)	**41**	(c)	**42**	(b)
43	(a)	**44**	(b)	**45**	(d)	**46**	(a)	**47**	(b)	**48**	(d)	**49**	(a)
50	(b)	**51**	(c)	**52**	(c)	**53**	(d)	**54**	(c)	**55**	(d)	**56**	(a)
57	(c)	**58**	(b)	**59**	(b)	**60**	(d)	**61**	(c)	**62**	(a)	**63**	(d)
64	(a)	**65**	(c)	**66**	(d)	**67**	(b)	**68**	(a)	**69**	(d)	**70**	(c)
71	(b)	**72**	(b)	**73**	(a)	**74**	(b)	**75**	(b)	**76**	(a)	**77**	(a)
78	(c)	**79**	(b)	**80**	(a)								

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TIME FOR NKJ-CLASS TEST !



Dear NKJ Student !

Please Request your Faculty to Conduct Test of Past Chapter and ensure that the test is surely conducted.

Its mandatory !

"Practice makes a man perfect"

CHAPTER 4 PRICE DETERMINATION IN DIFFERENT MARKET

MARKET refers to a mechanism or an arrangement that facilitates contact between the buyers and sellers for the sale and purchase of goods and services.

The nature of the market depends upon several things including the following:

1. **Number of Buyers and Sellers and Competition Between them :**
   - **Monopoly:** In case of a monopoly, there is only one seller. And he does not face any competition from other suppliers. He can, therefore, decide to charge any price of his liking for his product. What may deter him to do so, however, is the impact of the price charged on the quantity demanded of his product and the resultant change in the profitability of his firm.
   - **Perfect Competition:** The buyers and sellers are in such a large numbers that no single individual can perceptibly influence the total demand or supply. In this set of circumstances, each individual buyer and seller is a 'price taker' and has to accept the price of the good as determined by interaction between total demand and supply.
   - **Monopolistic Competition:** Monopolist competition is a market structure in which there are many sellers of a commodity, but the product of each seller differs from that of the other sellers in one respect or the other.
   - **Monopsony;** Market in which a large number of sellers are confronted with a single buyer. This market is known as a monopsony.
   - **Bilateral Monopoly:** If a single buyer is confronted with a single seller we have a market termed a 'bilateral monopoly'.
   - **Duopoly:** A duopoly stands for a market in which there are two sellers and a large number of buyers.

2. **Time Factor:**

   It is a common knowledge that demand and supply forces undergo a change with the passage of time. Basically, it is far more difficult to ascertain the manner in which demand for a good may be revised over time. There is no standard theoretical framework available to us by which to specify it. Therefore, demand conditions are mostly assumed to remain unchanged with the passage of time. However, the economists have been able to identify the factors which alter the cost conditions (and therefore supply conditions) of individual firms and industry with the passage of time. The division of markets on the basis of time factor is generally in the categories of –

   (i) Day to Day Market Period (or just Market Period).

   (ii) The Short Term Normal Period.

   (iii) The Long Term Normal Period, and

   (iv) The Secular Trend.

   In the discussion that follows, we shall define and cover the first three of them. The fourth one will be left out because it primarily belongs to the theory of growth economics.

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3. **Nature of the Commodity:**

In a perfectly competitive market, commodity must be homogeneous, while in monopolistic competition, the commodity is always differentiated. In monopoly, the product may or may not be homogeneous.

4. **Degree of Price Control**

Perfect competition is said to exist when the producer has no control over price. In contrast, the monopolist has full control over price. Monopolistic competition is characterized by partial control over price.

5. **Knowledge of the Market:**

In case of perfect competition, buyers and sellers have perfect knowledge of the market. In other forms of the market, there is imperfect knowledge of the market.

6. **Mobility of Factors:**

Perfect mobility of the factors is another unique characteristic of perfect competition. It is not an essential feature of other forms of the market.

A Firm:

A firm is a business unit engaged in the task of producing/selling of some specified good or service. It is identified by the fact that it has only one unit of entrepreneurship. However, the firm has a unified and coordinated authority of decision-making. In essence, these decisions relate to the objectives (such as, profit maximization, or sales maximization, etc.) and other policy decisions (such as, what to produce) of the business unit.

An Industry:

An industry is a set of firm which is conceptually closely associated in the sense of having some "common" type(s) of activities. The good supplied by the firms of the industry may be 'homogenous' in the sense that the buyers believe that products of all firms are perfect substitutes of each other. A consignment of the good, by itself, does not provide the identity of the supplier. The buyers, therefore, are indifferent between the sources of supply. In contrast, the industry may also comprise those firms which are producing 'differentiated' products. However, if the firms are to belong to one industry, then their products must be 'close substitutes' of each other.

There is no pre-determined number of firms which an industry must have. Their number can vary according to the structure of the market. At one extreme, it may, have only one firm in which case it is called a monopoly or a 'one-firm industry'. And at the other extreme, an industry may have such a large number of firms that each of them accounts for an extremely small portion of the total supply of the industry and is not able to influence the price of the product. Between these two extremes, there can be several other possibilities.

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SOME BASIC CONCEPTS OF REVENUE

The amount which a firm receives from the sale of the output is known as Revenue. According to Prof. Dooley, "The Revenue of a firm is its sales receipts or income."
Revenue of a firm can be divided into three types,

1. Total Revenue
2. Average Revenue
3. Marginal Revenue

Total Revenue

Total Revenue is the amount receipt from the sale of the output. The total revenue depends on the total sale of the firm and the price of per unit output.
TR = Q X P
Where TR = Total Revenue, Q = Quantity or unit sales, P = Per unit price of the commodity

Average Revenue

We can obtain the average revenue by dividing the Total revenue by total unit sold.
AR = TR / Q
Where AR = Average Revenue, TR = Total Revenue, Q = Total unit sold
It should be noted that AR or average revenue is equal to price, in the coming topics we shall discuss why the average revenue is equal to price.

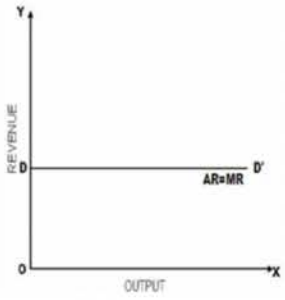
Marginal Revenue

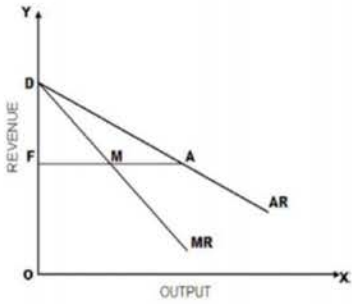
Marginal Revenue is the amount of money received from the sale of additional unit or in other words, additional revenue received by the sale of an additional unit.
MR = TRn – TRn-1
Or
MR = □TR / □Q
Where MR = Marginal Revenue, □TR = Change
sale, TRn
= Total Revenue of n units, TRn-1 = Total Revenue of n-1 units.

Graphically, therefore, we have the following relationships.

Since TR, AR and MR are equal for the first unit sold, therefore, the three curves start from the same point. TR curve slopes upwards so long as MR is positive. If MR is falling with an increase in the quantity of sale, then TR curve will gain height at a decreasing rate. It reaches its maximum height when MR curve touches X-axis. TR curve slopes downwards when MR curve goes below X-axis to become a negative figure. A change in AR causes a much bigger change in MR. Therefore, when AR curve has a negative slope; MR curve lies below it and has a greater slope. Similarly, when AR curve has a positive slope, MR curve lies above it andhas a greater slope. When AR curve is parallel to X-axis, MR curve coincides with it. In case AR is a straight line, MR curve will bisect each perpendicular distance of AR from Y-axis. However, if AR curve is parallel to X-axis, then MR curve coincides with it.

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PERFECT COMPETITION

Features of Perfect Competitions:

1. **Large number of buyers and sellers:** In perfect competition there is large number if buyers and sellers. Their number is so large that no buyers and sellers is in a position to influence the demand, supply and market price by his independent action. In fact, all the buyers and sellers in the market are price taker rather than price market, which is determined by taking whole demand and supply together.
2. **Homogenous Products:** In a perfectly competitive market, all the firms produce perfectly identical or homogenous product. It implies that in a perfectly competitive market the product of anyone firm is a perfect substitute of the product of any other firm.
3. **Freedom of entry or exit:** Every firm is free to enter in the market or leave the market. Entry or Exit form the market depends upon the profit earned by the existing firm and time under consideration. If a firm in the market earns supernormal profit in short run, then in long run new firms will be attracted towards the market. On the other hand, in the event of, existing firm incurring losses in the short run some of the firm leave the market in long run. Thus due to freedom of entry and exit each firm in perfect condition can earn only normal profits in long run.
4. **Perfect knowledge of the market conditions:** In perfect competition all the potential buyers and seller have full knowledge about the price prevailing in the market. As result of this no buyer will be exploited by any seller by charging higher price than the price prevailing in the market. Like that no buyer is in a position to buy a product at the price lower than the market price.
5. **Economic Rationality:** Economic rationality is another feature of perfect competition. It means that every buyer and seller is motivated by his own economic interest in his decisions to buy or sell. This coupled with the assumption of perfect knowledge; ensure that a uniform price prevails in the market.
6. **Perfect mobility of the factors of production:** In perfect competitions, all the factor of production is mobile. There is also no restriction on the movement of the goods from one centre to another. Also buyers have no preference as between different sellers because the entire potential seller will offer same price.
7. **No Extra Transport Cost:** For one price to prevail throughout the market, it is essential that there is no extra transport cost for the consumers while buying a commodity from different sellers.

Note:

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i. Some economists have tried to distinguish between pure competitions and perfect competition, Pure competition is a narrower concept and it include only the first three characteristic of perfect competitions mentioned above. The pure competition is also regards as free competition.

ii. Perfect competition is also regards as myth by many economists because all the characteristic of perfect competition, explained above seldom exists in practical world.

Therefore it is impossible to find out of the perfect example of perfect competition.

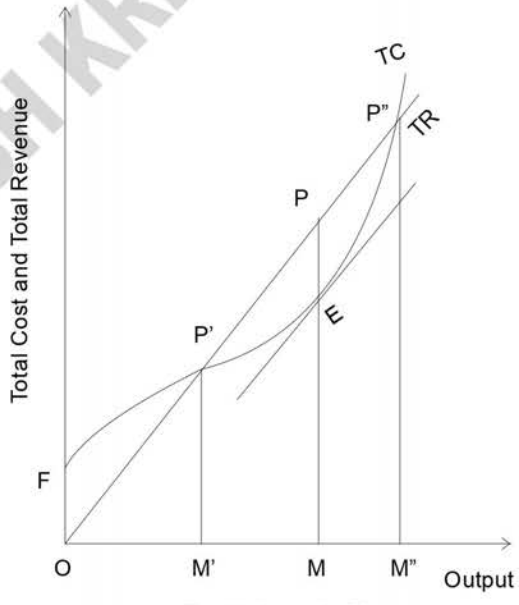
However, the gain markets approach the condition of perfect competition.

Equilibrium of the Firm under Perfect Competition – Price and OutputDetermination:

A firm always tries to maximize its profit and takes decisions such that this objective is satisfied to the maximum extent possible. This assumption is all the more relevant when the firm is operating under conditions of perfect competition because in such a situation it is a price taker and cannot influence the overall market by its individual actions.

When we think of the equilibrium of a firm, we should remember that under perfect competition it is not able to alter the price of the product by changing the quantity of its own output. It is also confronted with given price of the inputs and, therefore, given cost conditions. Under perfect competition, it can only decide the quantity of its output. Given the assumption of profit maximization by the firm, it will be in equilibrium when there is no scope for either increasing its profit income or reducing its loss by changing the quantity of output. It is this quantity of output, therefore, that is to be considered as its equilibrium output.

Total Revenue – Total Cost approach: Profit of a firm is defined as its total revenue minus total expenditure (total costs, or TC), therefore, in equilibrium, the firm maximizes this difference (TR – TC).



Equilibrium of a Firm

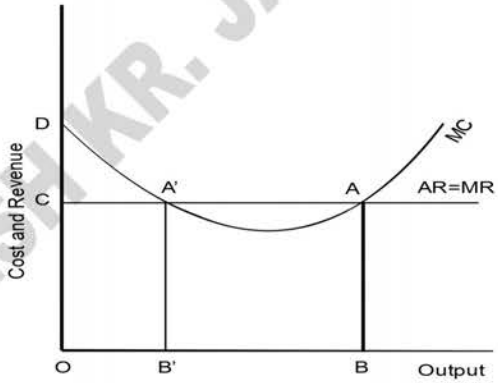
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The quantity of output is measured along X-axis while cost and revenue are measured along Y-axis.

In perfect competition, the price of the product is given and does not vary with the quantity produced and supplied by the firm. Accordingly, the curve representing total revenue (TR) is a straight line which starts from the origin O. Its slope is positive and equal to the price of the product (average revenue, AR, of the firm).

In the short run, a firm has to incur both fixed and variable cost. Fixed costs are there even when the output is reduced to zero. As a result, total cost (TC) curve starts from Y-axis at a positive distance from origin O. Assuming that fixed costs are OF, the TC curve starts from point F on the Y-axis. Recalling the application of law of variable proportions, we note that TC curve will not be a straight line. It will correspond to the three phases of the law of variable proportions. To begin with it will rise at a decreasing rate till point P' where the phase of increasing returns gives place to that of constant returns. At this stage, it intersects TR curve and lies below it. However, from point P' onwards, the TC curve rises at an increasing rate on account of the phase of diminishing return. It eventually intersects TR curve from below at point P" and lies above the latter if output is increased. In between, for output OM the vertical distance between TR and TC curves is the maximum. While TR is PM, TC is EM and the firm makes a total profit of PE. **Thus, OM is the equilibrium output of the firm in the short run under perfect competition. At any other output, its total profit is less than PE.** It is also noted that if the output is reduced to OM' or increased to OM", the profit of the firm is reduced to zero. Further, for output less than OM' or greater than OM", TC exceeds TR and results in a loss for the firm.

Marginal Revenue – Marginal Cost Approach :Graphically, this condition states that for equilibrium of the firm, MC curve should intersect MR curve from below and, after intersection, lie above MR curve.



Equilibrium of a Firm : MC and MR Curves

In the above figure, quantity of output is measured along X-axis and MR and MC are measured along Y-axis. Because of perfect competition, the firm is **a price taker**. Therefore, the price of the product is not affected by the quantity of output of the firm. The demand curve (which is the same as the AR curve for the firm) runs parallel to X-axis. The non-variability of AR implies that, with changing output, MR also remains constant and is always equal to AR. As a result, MR curve coincides with AR curve throughout its length.

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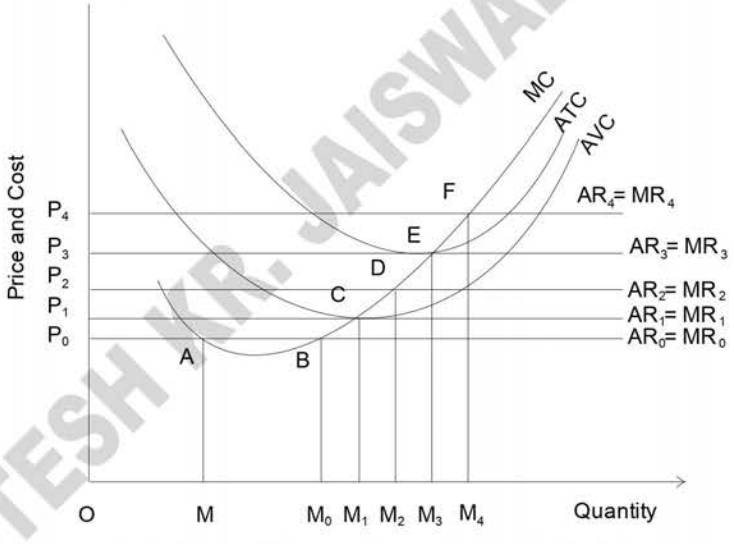
MC curve is U-shaped because of the fact that AC curve happens to be U-shaped. It starts from point D on Y-axis, slopes downwards till point K and then rises gain. In its downward sloping portion, it intersects MR curve at A' and in the upward sloping phase at point A.

However, point A' does not describe an equilibrium position of the firm. At this point, the first marginal condition is satisfied but not the second. The firm finds that if it expands its output beyond OB', there is a smaller addition to its total cost than to its total revenue. This is indicated by the fact that, to the right of A', MC curve lies below MR curve. However, if we consider the second point of intersection of MC curve with MR curve, (that is, point A), the second condition of equilibrium is also satisfied. To the right of point A (That is, for output greater than OB), MC curve lies above MR curve. It should also be noted that if the firm produces OB', its total cotwould be OCDA'B' as against total revenue of OCA'B', resulting in a net loss of CDA'. In contrast, when the firm produces OB, its total cost is given by ODA'KAB and its total revenue is given by OCA'AB. Assuming that 'normal profit' of the firm is part of its costs; the firm does not earn any abnormal profit or incur any loss when it produces OB.

Thus, in determination of short term equilibrium of the firm, two conditions should be satisfied:

(i) MR must equal MC and cut it from below ; and

(ii) AR must equal or exceed AVC.



Perfect Competition, Equilibrium of a Firm in Short Run

In the above figure, five different prices are considered to illustrate the supply behaviour and associated equilibrium of the firm.

(i) When the price is OP_0, the corresponding MR_0 curve cuts MC curve at two points, A and B. At point A, none of the above-stated two conditions of equilibrium is satisfied. At point B, MC curve cuts MR_0 curve from below but the second condition is not satisfied. AR is still less than AVC. Therefore, the firm incurs a loss greater than its fixed cost if it decides to produce when the price is OP_0. The firm, therefore, decides to close down but it cannot leave the industry.

(ii) If the price happens to be higher and equal to OP_1 (that is, equal to the least possible average variable cost), the firm decides to produce. In this case, not only MC curve cuts MR1

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curve from below (a point C), AR, is also equal to AVC. Thus, we find that either the firm does not produce at all, or it produces at least equal to OM_1.

(iii) In the third case, price (OP_2) exceeds AVC but is still less than ATC. MR_2 and MC curves intersect each other at point D. The firm produces OM_2. It still incurs a loss but less than its fixed costs because it is able to recover a portion of the latter.

(iv) In case the price rises to OP_3, the firm is able to recover its full cost including fixed costs. Its MC curve cuts MR_3 curve from below at point E and AR_3 = ATC. All the conditions of its equilibrium are satisfied. It produces OM_3.

(v) If the price rises even further, say, P_4, the point of intersection of MR_4 and MC curve moves to F. The firm is able to recover not only its total cost but is able to earn an abnormal profit also. It produces OM_4.

It should be noted that –

→ In the short run, existing firms can close down but they cannot leave the industry and new ones cannot enter it.

→ When our firm is incurring a loss, it continues production so long its loses do not exceed fixed costs.

→ If it earns an abnormal profit, they are not wiped out by new firms entering the industry.

1. **Long Run Normal Period:** Long term is defined as that period in which the firm has the opportunity of varying all its inputs. There are no fixed costs in the long run; the average cost curve of the firm formed by its short run average cost curves is also U-shaped. Up to a certain scale, there are increasing returns and LRAC curve slopes downwards. This is followed by the phase of constant returns. And the third phase is that of diminishing returns to scale in which LRAC curve slopes upwards. Long term marginal cost curve is also U-shaped and that it cuts LRAC from below at the lowest point of the latter.

   Since the firm can vary all its inputs in the long run, it follows that it has the option to close down and leave the industry. Similarly, new firms can also enter the industry. This condition, termed 'free entry and exit of firms' has to implications.

– The firm is not compelled to operate when incurring a loss. It can leave the industry.

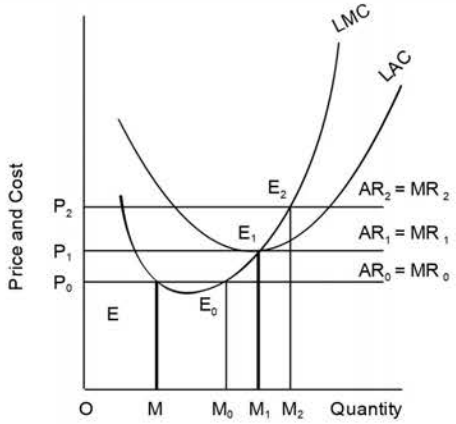
– No firm is able to earn an abnormal profit**. It can only earn 'normal profit'** which forms a part of its costs and is incorporated in its LRAC curve. This happens because abnormal profit earned by existing firms attracts new firms. And as they enter the industry, supply increases, price comes down and abnormal profit is wiped out.

Two conditions have to be satisfied for the firm to be in long run equilibrium.

i. **MC curve must intersect MR curve from below :**

ii. **AR ≥ AC, so that the firm does not incur a loss and close down. In practice, however, on account of free entry and exit of firms, AR cannot exceed AC and is equal to the latter.**

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Perfect competition. Long Run Equilibrium of a Firm

In the above figure output is measured along X-axis and costs are measured along Y-axis. The firm is a price taker. For it the price of its product is given and fixed. It can sell any quantity itcan produce at the going price. Its AR curve runs parallel to X-axis and MR curve coincides with it.

For the purpose of explaining the determination of firm's equilibrium, three alternative prices given to the firm by the industry.

(i) Let us assume that the price in the market is below the optimum cost of the firm, say, OP_0 from which we get corresponding average revenue (AR_0) and marginal revenue (MR_0) curves. Now MR_0 curve cuts LMC curve at two points, E and E_0, but none of these is a long term equilibrium position of the firm. At point E, LMC curve cuts MR_O curve from below, but the second condition of equilibrium is not satisfied. AR_0 is < LAC and the firm incurs a loss.

→

(i) Let the price be OP_2 with average revenue curve (AR_2) and marginal revenue curve (MR_2). LMC curve is intersecting MR_2 curve from below at point E_2 and AR_2> LAC. But the firm is not allowed to enjoy the abnormal profit. New firm enter the industry, supply increases and price falls till no firm can earn abnormal profit.

→

(i) Let the equilibrium price is OP_1. Marginal revenue curve (MR_1) cuts LMC curve from below at lowest point of LAC (E_1). At the same time, AR_1 is equal to LAC, so that the firm does not incur a loss or earn an abnormal profit. At this stage, there is no incentive for existing firms to leave the industry or new ones to join it. The corresponding equilibrium output is OM.

→

In conclusion, in long run equilibrium, the firm produces an 'optimum' output at the least possible average cost. It is this position where the firm is operating under 'constant returns' to scale. **Consequently, its MC = AC. At the same time, MC = MR and AR = AC, so that we get –**

AC = AR = MC = MR

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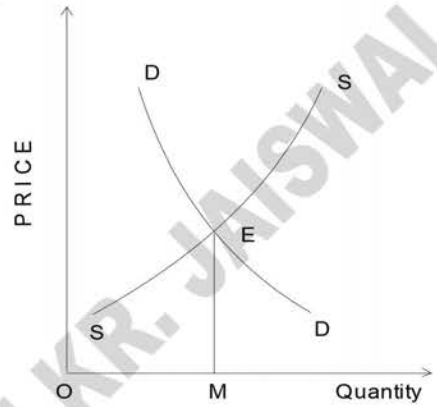
Equilibrium of Industry under Perfect Competition

An industry comprises all the firms which are producing goods which the buyers consider substitutes of each other. As such, the determination of price of such a product is the result of interaction between total demand for the output of all the firms taken together and their supply.

A firm can sell more of its output by attracting customers from its competing firms. In the process, the total sales of the industry need not increase. But an industry can sell more when the existing buyers buy more of its product and/or new buyers enter the market and buy its product. Now it follows that existing buyers are already equating their marginal utility with the price. They would buy more only if price falls. Similarly, for the new buyers, the existing price is higher than the marginal utility of the product. And, therefore, they would also buy more of the good only if the price is reduced. Accordingly, the demand curve for the product of the firm must have a negative slope indicating that more of the product can be sold only by reducing its price.

Short Term Equilibrium of Industry:

Industry's supply curve is the summation of individual supply curves of the firms constituting it. Since the supply curve of a firm, in the short run, is that upward sloping portion of its marginal cost curve which lies above its average variable cost curve, therefore, the supply curve of the industry also is upward sloping.



Demand and Supply

In the above figure quantities demanded and supplied are measured along X-axis and price per unit is measured along Y-axis. While the demand curve is downward sloping, the supply curve has a positive slope. Short term demand and supply curves of the industry intersect at point E. The equilibrium price and output of the industry are, therefore, EM and OM respectively. It is noteworthy that in case the industry happens to be in a non-equilibrium position, it automatically gets adjusted to its equilibrium position. This is because, in such a case, there is either an excess of supply or an excess of demand at the existing price. In case of excess supply, the firms are left with unsold stocks which they try to dispose off by reducing price. And in case of excess demand, some customers are not able to buy the quantities they wanted to. They, therefore, bid up price in competition with each other.

Long Term Equilibrium of Industry:

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The slope of the demand curve of industry remains negative even in the long run implying that it can sell more of the product only by reducing the price and vice versa.

However, the long run supply curve of the industry cannot be derived by horizontal summation of the supply curves of the individual firms. The reason is that in the long run, existing firms can leave the industry and new ones can joint it. Long run supply curve is not derived by adding those portions of the MC curves of the individual firms which lie above the AC curves of the firms. Instead, it is the locus of the pairs of those points which represent quantities of its output and the least average cost at which its firm scan produce it.

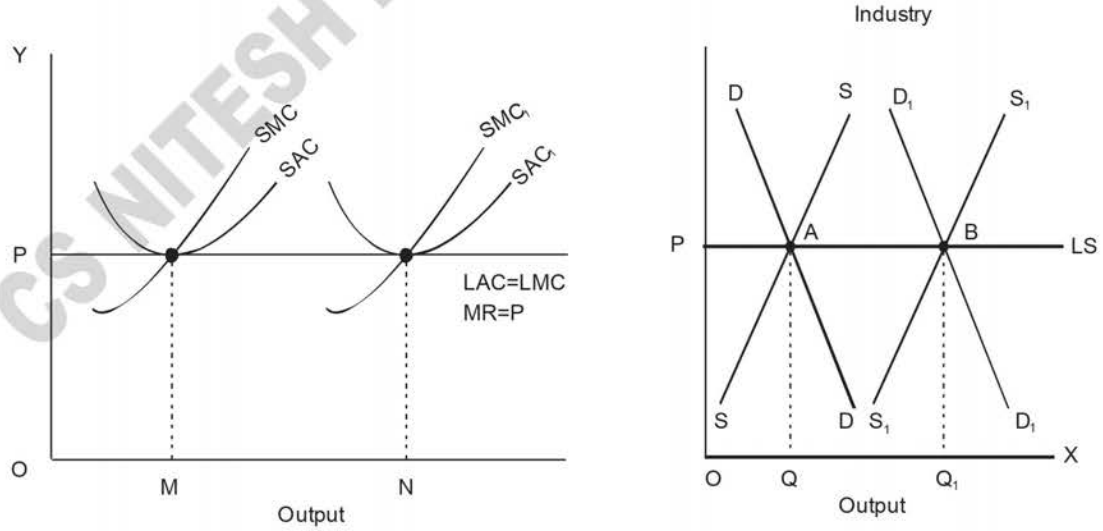
Long-run supply curve of the industry depends upon the change in the optimum size of the firms as also the change in their number. There are two reasons for it: (i) in the long run firms may enter and leave the industry; or (ii) Firms may enjoy economies and suffer diseconomies of scale. Long-run supply curve of the industry is known by multiplying long-run optimum production of a firm by the number of firms operating in the industry, that is.

$$S = Q \times N$$

(S = long-run supply of industry; Q = optimum output of firm; N = number of firms in the industry.)

The shape of long-run supply curve of the industry depends on the fact as to which law of costs applies to the production of the firms. (1) if production obeys law of constant cost, then long-run supply curve of the industry will be an horizontal line parallel to OX-axis. (2) If production obeys law of decreasing cost, then long-run supply curve of the industry will slope downwards. (3) If production obeys law of increasing cost then long-run supply curve of the industry will slope upward. Different shapes of long run supply curves of industry are explained as under:

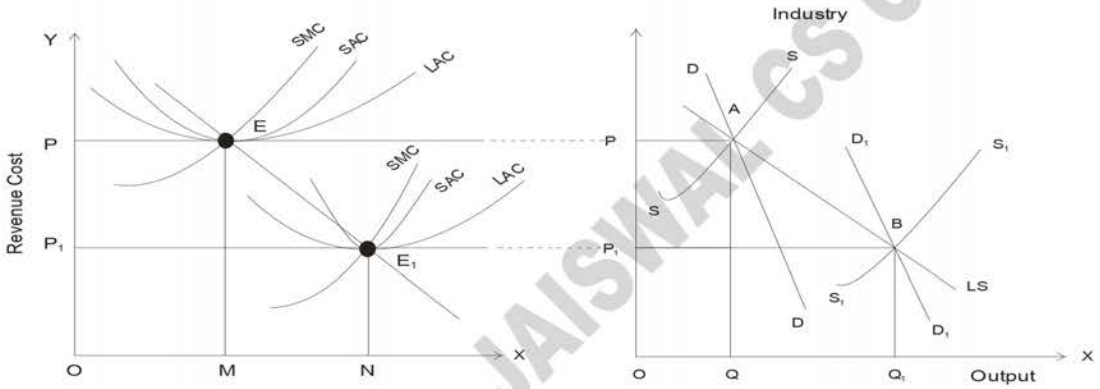
a) **Constant cost Industry and Supply Curve:** Constant cost Industry refers to such an industry wherein increase or decrease in production makes no change in average cost and price, both remain constant. Accordingly, supply curve of constant cost industry is a horizontal straight line.



In the above fig. (A), cost, supply and revenue curves of a firm are shown. In the Fig. (B), demand and supply curves of an industry are shown. Suppose, a firm can make use of two

types of plants. SMC and SAC represent marginal cost and average cost curves of a small plant. SMC_1 and SAC_1 represent cost curves of a big plant. Minimum average cost of production of both these plants is the same, i.e., OP> If the firm produces OM amount of output with small plant and more than OM amount, i.e., ON output with big plant. Its minimum average cost remains OP. Accordingly, at price OP firm's SAC, SMC, SAC_1; SMC_1. MR and AR all will be equal. To avoid complication. LMC and LAC curves have not been shown. All firms operating in this industry produce under constant cost. Thus, it is clear thatdemand curve DD and supply curve SS are in equilibrium at point A. At equilibrium point A, the industry produces OQ amount of output at OP price. If due to increase in demand, the new demand curve is D_1 D_1 and new supply curve is S_1 S_1 then the new equilibrium point is B. It means at the old price, i.e., OP industry will supply more quantity than before, i.e., QQ_1. In the other words, industry can supply as much quantity as it likes at OP price. Accordingly. Industry's long-run supply curve will be AB (LS). It is horizontal line parallel OX-axis.

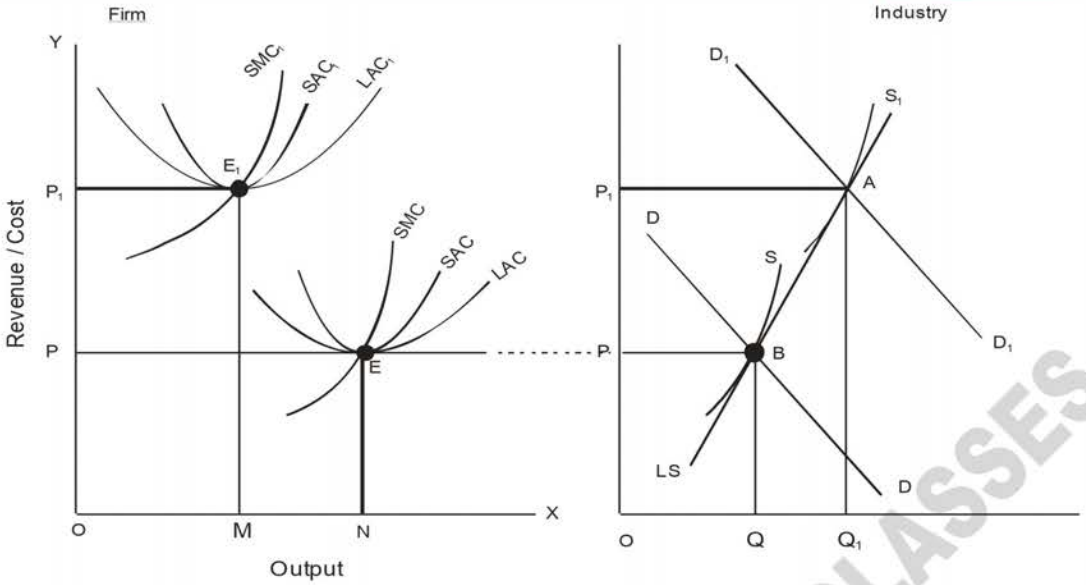
b) **<u>Decreasing Cost Industry and Supply or Increasing rule Curve :</u>** Decreasing Cost Industry refers to that industry in which costs go on decreasing as the industry expands.



In the above fig. (A) SMC, SAC and LAC are short-run marginal cost, short-run average cost and long-run average cost curves respectively of the firm. Initially, the firm is in equilibrium at point E, i.e., at OP price it produces OM output. As the industry expands, the firm gets several types ofexternal economies, Consequently, its new equilibrium is established at point E_1.In this situation, firm's output increases form OM to ON. Firm's new cost curves, i.e., SMC_1, SAC_1, and LAC_1 will shift downward. EE_1 will be the long-run supply curve of the industry is shown. DD is the initial demand curve. It intersects supply curve SS at point A. Accordingly, OP price is determined where quantity demanded OQ is equal to quantity supplied. When demand increases to D_1 D_1 new equilibrium is established at point BV. On account of increase in demand, there will be increase in supply as will. It is shown by Q_1. Cost and price will fall to OP_1. Accordingly, long-run supply curve AB (LS) of the industry will be sloping downward.

(c) **<u>Increasing Cost Industry and Supply Curve :</u>** Increasing Cost Industry refers to one, wherein increase in production is followed by increase in costs. Thus, when output is increased to meet increased demand, average cost also increases.

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In fig. (A), firm's long-run supply curve and in fig.(B) industry's supply curve have been shown. Initially, a firm is in equilibrium at point E and is producing the goods with the help of plant A. This plant enables the firm to produce ON output at OP cost and price. If the demand curve of the industry increases from DD to D_1 D_1 then the equilibrium point of the industry shift from B to A and equilibrium price will increase from OP to P_1. Several new firms will enter the industry shift from B to A and equilibrium price will increase from OP to OP_1. Several new firms will enter in the industry to take advantage of this rise in price. Accordingly, demand for factors of production will exceed their supply. This will raise the factor-price. Accordingly, demand for factors of production will exceed their supply. This will raise the factor-rice and hence cost of production. In view of the rising costs, the firm may deem it proper to cut down the production. But in the long-run the firm will produce at the minimum average cost and may use small-sized plant and be in new equilibrium position at E_1. In this situation, the firm will produce less than before, that is, OP_1. Although an individual firm is producing less at higher cost, yet on account of entry of several new firms in the industry, total supply of the industry will increase form OQ to OQ_1. Thus, due to increases in demand there will be more supply in industry despite higher cost and price, although supply of individual firm's falls. Accordingly, long-run supply curve LS of the industry will be sloping upwar

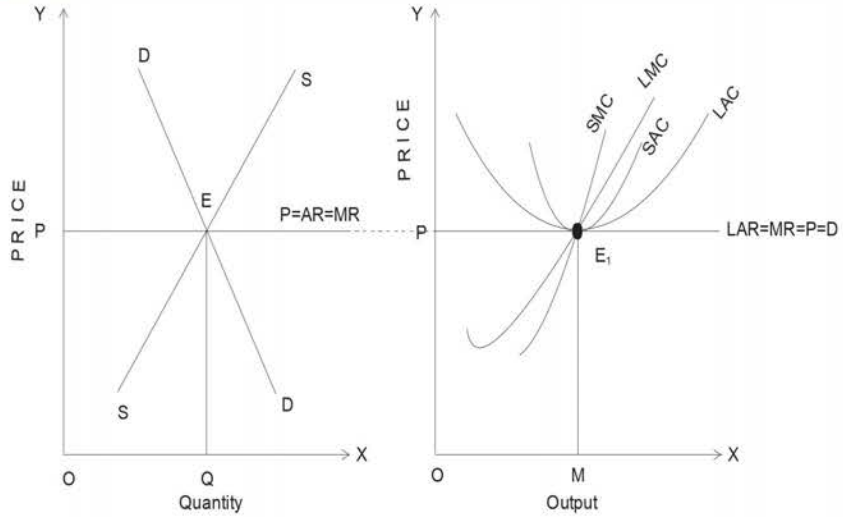
Long –run equilibrium of the industry:

When

(i) All the firms are earnings normal profits only i.e. all the firms are in equilibrium

(ii) There is no further entry or exit form the market. The industry is said to haveattained long-run equilibrium.

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Above figure, shows that in the long-run AR=MR=LAC=LMC. At E_1, the minimum of LAC curve. The firm's produces equilibrium output OM at the minimum (optimum) cost. The firm producing output at optimum cost is called an optimum firm. All the firms in the perfect competition in long-run are optimum firms having optimum size and these firms charge possible price which just covers their marginal cost.

Thus in the long-run

i. LAR=LMR=P=LMC=LAC
ii. The firms just earn normal profits and
iii. Competition firms are of optimum size.

MONOPOLY

The terms monopoly refers to that markets in which there is a single seller of goods with no close substitute. Therefore, the word monopoly refers to the situation alone to sell. Pure monopoly is never found in practice. However, public utility services such as transport, water, electricity, etc. may be goods example of monopoly form of market.

Features of the monopoly market:

1. **Single seller of the product:** In a monopoly market there is only one firm producing or supplying the product. As there is only one firm in the market, therefore, that single firm constitutes the industry and that's way there is no difference between industry and firm in the monopoly market.
2. **Restriction to entry:** In monopoly market, no outside firm can enter the market. Restrictions on the entry of other firms may be legal, economic, artificial or institutional.
3. **Absence of close substitute:** Generally there is no close substitute of the monopolist's product in the market. In such a situation, the cross elasticity of demand between the product of the monopolist and the products on any other firm is zero or very small. The price elasticity of the monopolist's product is also less than one. Therefore, the monopolist faces a downwards sloping demand curve.
4. **Monopolists are price maker:** The monopolist firm unlike a perfectly competitive firm is s price maker. The monopolist determines the price as well as output for his product.

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5. **Price Discrimination**: Price discrimination refers to the practice of charging different prices
6. from different buyers for the same goods.

Sources of monopoly power:

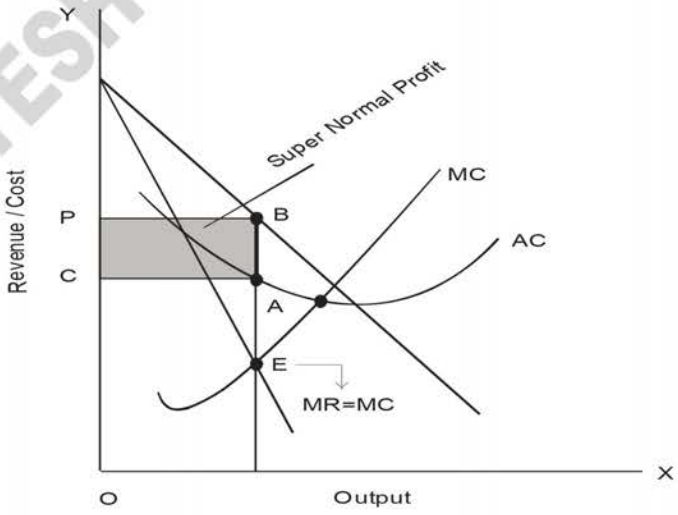
1. **Natural factor:** A firm may enjoy monopoly because of its control over a crucial raw material or mineral e.g., petrol, uranium etc.
2. **Legal factor:** A firm can legally process monopoly power e.g. patent right copyright etc.
3. **Cost factor:** A firm may produce at such a low cost at which no other firm can product a commodity. Rival firms entry is prohibited by low cost competition.
4. **Market factors:** Sometimes the size of market is so small that it cannot accommodate more than one firm.
5. **Heavy investment**: Certain industries like iron and steel, locomotives etc. need heavy investments which only particular firm can afford to arrange.
6. **Protection of public rights:** Motivated by public welfare and public interest the government itself can assume monopoly power e.g. railways, posts and telegraph, electricity and water supply etc.

Monopoly equilibrium

Short term Equilibrium Price and Output Determination:

Short-run refers to that period in which time is so short that a monopolist cannot fixed factors, like machinery, plant, etc. Monopolist can increase his output in response to increase in demand by changing his variable factors. A monopolist will be in equilibrium when he produces that amount of output at which (i) marginal cost is equal to marginal revenue and (ii) marginal cost curve cuts marginal revenue curve from below. A monopolist in equilibrium may face three situations in the short period:

1. **Super Normal Profit:** If the price of equilibrium output is more than average cost (AR > AC) then the monopolist will earn supernormal profits.

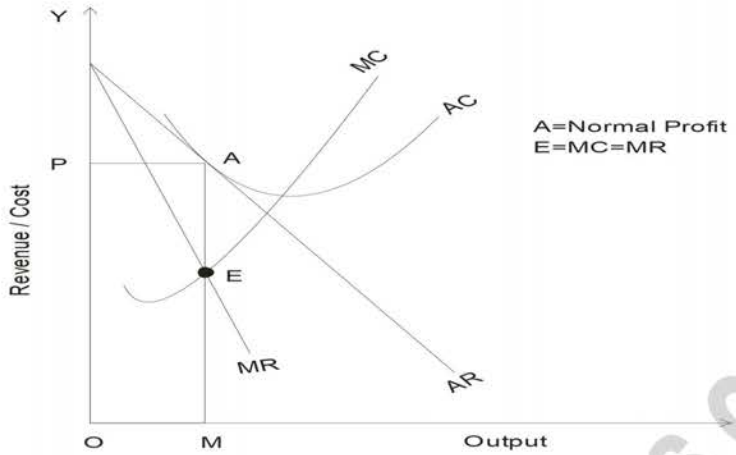


The monopolist is in equilibrium at point E, because at this point marginal cost is equal to marginal revenue and MC curve is cutting MR curve form below. The monopolist will

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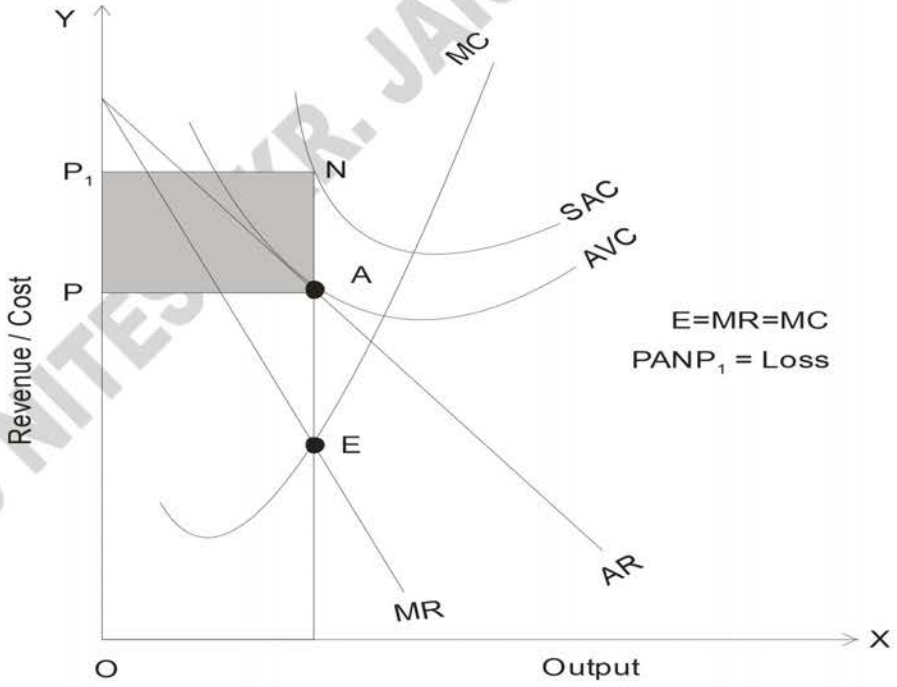
produce OM units of output and sell it at MB price which is more than average cost AM to BA per unit. (BM-AM=BA). Thus, in this situation on total super normal profit of the monopolist will be ABPC.

2. **Normal Profit:** If in the short run equilibrium (MC=MR), the monopolist price (AR) is equal to its average cost (AC), i.e., AR=AC, then he will earn only normal profit.



This is shown in fig. the firm is in equilibrium at point E. OM is the equilibrium output. At this output, average cost (AC) curve touches average revenue (AR) curve at pint A. Thus, at point A price OP (AR) is equal to the average cost (AM) of the product. Monopoly firm, therefore, earns only normal profit in equilibrium situation, as t equilibrium output its AC = AR.

3. **Minimum Loss:** A monopolist in equilibrium, in the short period, may bear minimum loss equivalent to fixed costs.



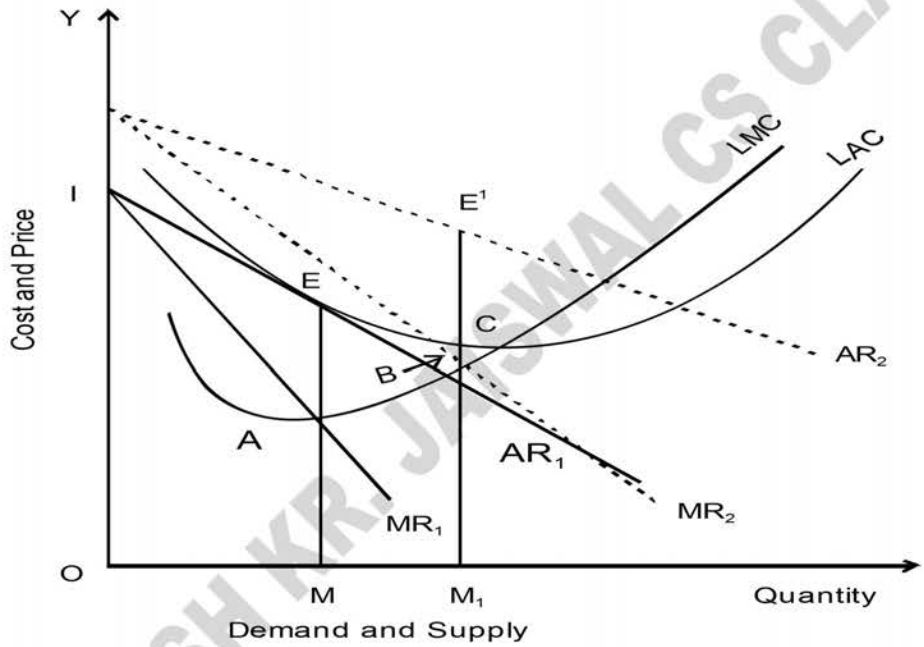
In this situation, equilibrium price (AR) is equal to average variables cots (AVC) and the monopolist bears the loss of fixed costs. The monopolist is in equilibrium at point E. MC=MR

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and MC curve cuts MR curve form below. He produces OM output. The price of equilibrium output OM is fixed at OP (AM). AT this price, average variable cost (AVC) curve touches AR curve at point A. It means that the firm will cover only average variable cost form the prevailing price. The firm will bear the loss of fixed costs, or A per unit. The firm will bear total loss equivalent to $NAPP_1$ as shown by the shaded area.

Long Term Equilibrium Price and Output Determination:

In the long run, by definition, the monopolist can vary all the inputs. Therefore, the determination of equilibrium of the firm can be analyzed with the help of only two cost curves, namely, AC and MC. Moreover, the monopolist would not stay in the market if he is to operate a loss. By implication, therefore, the demand curve must be tangent to the AC curve or must lie to the right and intersect it twice.



Long Term Equilibrium of a Monopolist

In the above figure, long term AC and MC curves of the monopolist are drawn U-shaped. Equilibrium of the firm is that its MC curve should cut MR curve from below and its AR should be greater than or equal to AC. Two alternative cases of the determination of equilibrium of the monopolist, namely, (i) with normal profit, and (ii) with abnormal profit.

In the first case, demand curve (AR) of the monopolist **is AR, and it is tangent to AC** or LAC curve at point E. It should be noted that if demand curve lies to the left of AC curve, the monopoly is not able to recover its AC at any output and, therefore, it closes down and leaves the market. However, when AR curve is tangent to AC curve, the monopoly is able to recover its average cost (including normal profit) and is therefore; ready to stay in the market and produce. Further, it should be noted that, by the very nature of relationship between MR and AR on the one hand and between MC and AC on the other, (i) the perpendicular drawn from point E to X-axis, (ii) the

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MC curve and (iii) MR curve are concurrent (at point A). As a result, all the conditions of equilibrium of monopoly are satisfied. Thus, at point A, MC curve of the firm cuts MR curve from below. At the same time, AR is equal to AC at point E. accordingly; the monopoly produces OM and sells it a price EM per unit which covers its average cost including normal profit.

In the second case, the monopolist is able to make an abnormal profit. Its marginal revenue curve is MR_2 which cuts its MC curve from below at point B. The corresponding height of its average revenue curve (AR_2) is M. accordingly, the monopolist produces OM and is able to sell it at E'M' per unit with an extra profit of E'C per unit. Moreover, this extra profit is not competed away because there is no substitute good in the market and no new firm can enter the market and produce it.

Price Discrimination or Discriminating Monopoly

Price discrimination occurs when the same commodity is sold at more than one price. A monopolist often charges different prices of the same product from different buyers or for different uses from the same buyer. This price policy of the monopolist is called price discrimination. The monopolist practicing it is called Discrimination Monopolist.

Types of Price Discrimination

1. Personal Price Discrimination
2. Geographical Price Discrimination
3. Price Discrimination according to Use
4. Price Discrimination according to Time

Degrees of Price Discrimination

1. **Discrimination of the First Degree:** The discrimination of the first degree is that situation in which the monopolist charges each consumer a different price.
2. **Discrimination of the Second Degree:** The discrimination of the second degree is the situation in which the monopolist charges different prices for different units of the same commodity.
3. **Discrimination of Third Degree:** It refers to that discrimination under which a monopolist divides the entire market of a production into two or three group and charges different prices from each group.

Essential Condition for Price Discrimination

1. **Existence of Monopoly Power:** A seller must posses monopoly power if it is to practice price discrimination. In the absence of monopoly power, a seller is not able to charge some customers higher prices than others.
2. **Separate Markets:** Another condition necessary for discrimination monopoly is that there must be two or more markets which can be separated and can be kept separate.
3. **Difference in the Elasticity of Demand:** Price discrimination is possible when elasticity of demand will be different in different markets. The monopolist will fix higher price per unit in

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the market where demand is inelastic and lower price per unit in the market where demand is elastic.

4. **No Possibility of Re-sale:** Another condition for the existence of price discrimination is that the original purchaser cannot re-sale the produce or service.

Reasons for Price Discrimination

There are three main reasons for price discrimination viz.

→ The monopolist is aware of consumer **ignorance** for the cost of product due to lack of knowledge and communication of proper information.

→ In rendering **professional services** or personal services discriminating price can be charged by a monopolist from different customers. A doctor specialist having monopoly in his professional specialization can charge higher fee from rich and lesser fee from poor clients.

→ Price discrimination may be practiced under the circumstances when **cost difference** might exist due to distance between one market or another, lower price in poorer market and higher prices in sophisticated market could be charged. Such price discrimination occurs when firm's different markets are separated by distance or by national frontiers; cheaper commodity in one market may not be resold at dearer markets because of excessive cost of transportation.

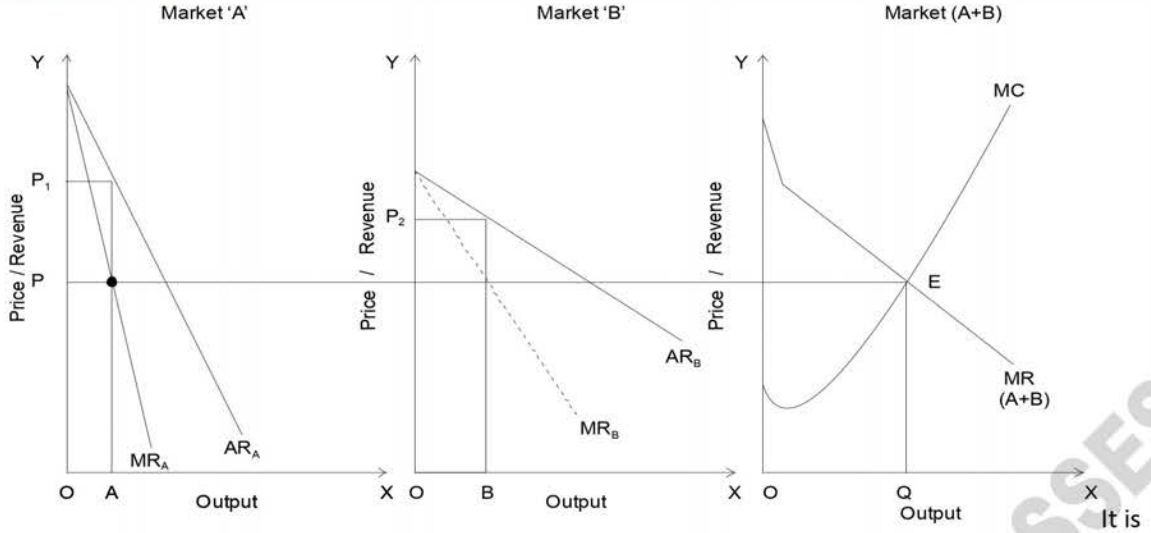
Price and Output Determination under Price Discrimination:

Profit maximization is the basic objective before a discriminating monopolist. For this purpose, he would like to avail of every opportunity what is available to any ordinary monopolist. The basic rule according to W.J. Baumol which he has to follow is that marginal revenue in all the markets where he is practicing discrimination should be similar. Monopolist can allocate his product in different markets on the basis of available MR from the best combination. The total market shows the aggregate AR and MR and the profit maximizing output of OQ. The optimum level of output for the firm is determined at OQ since at this level of output MR = MC. The whole output OQ cannot be profitably sold in one market because of the limited size of market. Therefore, the monopolist must allocate output OQ between two markets.

Suppose market is divided into two parts A and B. As is evident from the slopes of AR_A and AR_B demand curves of markets A and B respectively. The combined equilibrium position of both the markets is shown in monopoly firm will be at point E where combined MR is equal to MC of the total output OQ. The monopolist will so distribute his total output OQ in two markets so that MR of each market is the same.

In order to get this marginal revenue, the monopolist will sell OA quantity of output in market A and OB quantity in market B. He will sell less quantity in market A at P_1 price and more in market B at O P_2 price. Total quantity of output in two markets, i.e., OA + OB will be equal to the total output OQ produced by the monopolist.

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Clearfrom fig. (i) marginal cost of the total output is equal to combined marginal revenue, (ii) marginal revenue of both markets is equal, (iii) marginal revenue of both markets is equal to marginal cost of total output.

MONOPOLISTIC COMPETITION

Monopolist Competition is a market structure in which there are many sellers of a commodity, but the product of each seller differs from that of the other sellers in one respect or the other.

In this market structure, each seller is a monopolist of his differentiated product. The buyers can get it only from him and from none else. At the same time however, the products offered by different sellers are close substitutes of each other. The buyers are always comparing the prices of their products together with the perceived 'quality' of each. In other words, there is also an intense competition between suppliers for a share in the market. For this reason, it is a market structure in which there is a competition between groups of firms while each firm is a monopolist of its own product. It is, therefore, termed as monopolist competition.

However, defining a monopolistic competition in this manner, though very realistic, poses certain problems of its own.

- Since the products supplied by the competing firms are not homogeneous, therefore, we cannot define the concept of a 'market demand for the product' precisely, that is, it is not possible to determine the average revenue curve of the 'industry' as a whole.
- Not only that, it is very difficult to even define an industry in a precise manner for the reason that its constituent firms are not supplying the same product. At the most, we may think of a 'group' of firms selling close substitutes of each other.
- It is not possible to have a satisfactory definition of even a 'group'. This is because the 'product group' (such as scooters, or motor cycles) under consideration is itself in competition with other 'product groups'.

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Characteristic of Monopolistic Competition

1. **Large number of Firms and Buyers:** Under monopolistic competition there are large number of firms producing differentiated product and also large number of buyers.

2. **Product Differentiation:**. The differentiation may or may not be real. A real differentiation refers to the technical features of the product, including its technical life and performance, durability, cost of operation and maintenance, and the like. In contrast, a non-technical or imaginary differentiation may also be there. It may take the form of brand names, trademarks, packing, size, shape, and so on.

   Irrespective of the nature of product differentiation, it is expected that its adoption by a firm would 'increase' its demand. It provides an opportunity to the firm to tell the buyers that the combination of 'product quality' and price offered by it is better than similar combinations offered by its competing firms. On this account therefore, a firm under the monopolistic competition is not a price taker. The demand curve of each firm in monopolistic competition corresponds to that for the 'industry' as a whole, with the difference that it is comparatively more elastic.

3. **Freedom of Entry and Exit of Firms:** As in case of perfect competition, firms are free to enter and leave the industry under monopolist competition.

4. **Selling Expenses:** 'Selling expenses' are all those outlays which are made in order to create and/or increase its demand.

   Selling expenses may be incurred in several ways. They not only include advertisement through different media, show rooms and selling campaigns, but also 'discounts' and 'incentives' to the dealers and customers. Selling expenses may be informative and educative in the sense that they try to convince the customers, through 'informing' them of the 'benefits' of using the items being advertised, that they should buy this item in preference to something else. Similarly, some selling expenses are incurred to neutralize the perceived impact being created by the activities of the rival firms.

   It is generally agreed that the impact of selling expenses on demand for an item follows the law of variable proportions. That is to say, the average selling expenses per unit of sales exhibit the three phases of (i) increasing, (ii) constant, and (iii) diminishing returns in terms of additional of the quantity demanded on account of successive additions to selling expenses. This phenomenon is explained by pointing out that advertisement and other forms of selling expenses gain effectiveness only if they are incurred heavily and repeatedly. Moreover, an addition to the selling budget opens up more effective and wider options to the firm. However, the sources of these benefits tend to get exhausted s the size of selling budget is increased. The average selling cost curve (ASC curve) assumes a U-shape. However, given the selling budget of the firm, the average selling cost curve will be a rectangular hyperbola. It will be similar to the average fixed cost curve of the firm.

5. **Partial Control over Price:** Each firm has limited control on the price of its product. Average and marginal revenue curves of a firm under monopolistic competition slope downwards as

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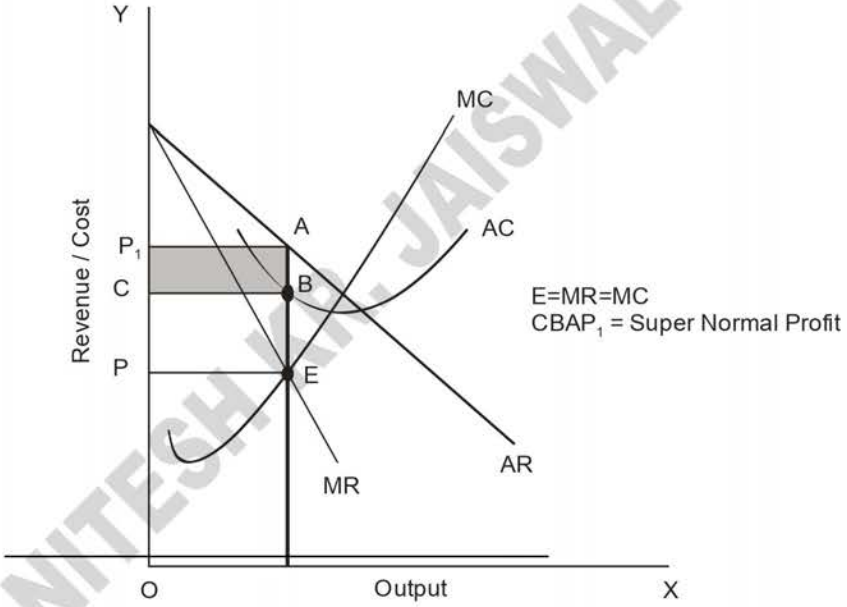
in case of monopoly. It means if a firm wants to sell more units of its product it will have to lower the price per unit.

6. **Limited Mobility:** Under monopolistic competition neither the factors of production nor goods and service perfectly mobile.
7. **Imperfect knowledge:** Buyers and seller lack perfect knowledge about the price of the product because it is not possible to compare the product of different firm due to product differentiation.
8. **Non-price Competition:** Another feature of monopolistic competition is that different firms may compete with one another without changing the price.

EQUILIBRIUM OF A FIRM UNDER MONOPOLISTIC COMPETITION:

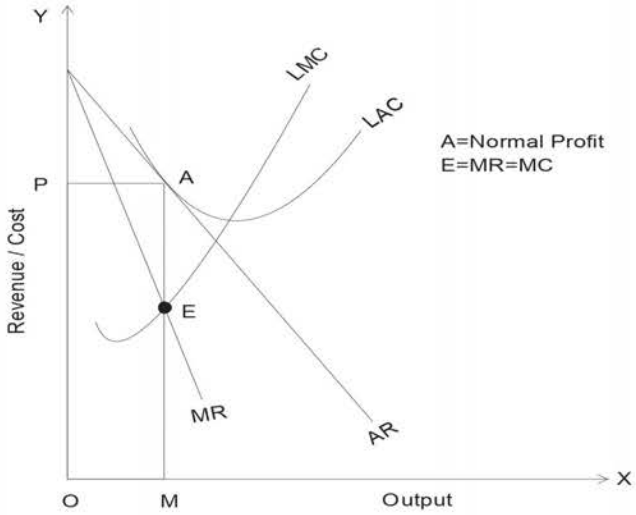
Short Period Equilibrium in Monopolistic Competition

1. **Super Normal Profit:** Firm is in equilibrium at point E, because at this point MC=MR and MC curve cuts MR curve from below. Point E indicate that the firm's equilibrium output is OM. Price of equilibrium output is OP (=AM). This equilibrium price AM is greater than average cost BM (AM>BM). Hence the firm earns super normal profit equivalent to the difference between AM and BM i.e., AB per unit. Total super normal profit of the firm is equilibrium is ABCP, the shaded area.



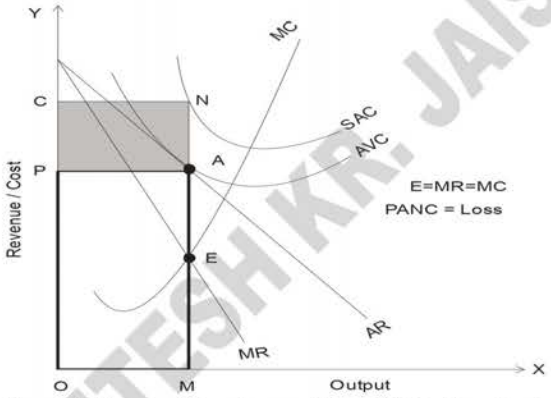
2. **Normal Profit:** In the short period, a firm under monopolistic competition may earn normal profit. Firm is in equilibrium at point E. Point E indicating that OM will be the equilibrium output. Price of the equilibrium output is OP (=Am) and average cost is also OP (=AM). It is so because, AR curve is touching AC curve at point A. Hence, at the level of equilibrium output, AR is equal to AC and the firm earns normal profit.

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3. Minimum Loss:

The firm will be equilibrium at point E. At this point MC=MR. In equilibrium position, the firm will produce OM units of output. Price of equilibrium output OM is OP (=AM) and average cost is OC (=NM). Average cost of the firm is more than the price (AC>AR). Hence, the firm suffers a loss equivalent to NM-AM=AN per unit. But the price of equilibrium output OM is equal to average variable cost (AVC), as curve AVC touches curve AR at point 'A'. Thus, in case of equilibrium the firm covers only AVC from the prevailing price AM. It is incurring loss of fixed cost equivalent to AN per unit.



The total loss of the firm will be NAPC, the shaded area.

Long Term Equilibrium – Price and Output Determination

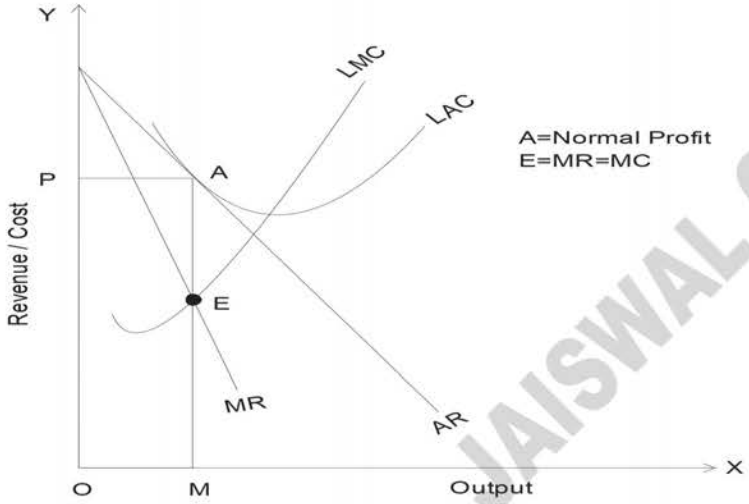
In discussing long run equilibrium of a firm under monopolistic competition we should specifically note the following facts.

- In the long run, there are no fixed costs. The firm can not only vary all its inputs, it can also vary its selling costs.
- No firm can be compelled to operate at a loss. It can always leave the industry.
- Similarly, if the demand is string so as to bring abnormal profit income to the existing firms, new firms can enter the 'Product group' and produce close substitutes of the existing products.

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- Each firm operating under monopolistic competition is thus able to make a choice between alternative combinations of
  I. Product quality,
  II. Product differentiation, and
  III. Selling costs.
- In addition, it must also take note of the fact that any variation of price on its part can lead to a price reaction by its rivals also.

Long-run is the period of time in which firms are able to change the scale of their plants and to leave or enter the market. Since there is free entry and exit in monopolistic competitive market, the long-run equilibrium is a situation in which all the firms, although they are maximizing profits, earn only normal profits. In the long-run, the firms under monopolistic competition will (i) neither earn super normal profits, (ii) nor incur losses but (iii) earn only normal profits.



LAC is long-run average cost and LMC is long run marginal cost; AR is average revenue and MR is marginal revenue curve. MC=MR curve and LMC is cutting MR curve at point E which is equilibrium point. OM is the equilibrium output and OP (=AM) is the price of equilibrium output. At equilibrium output OM, average revenue curve is tangent to long-run average cost curve at point A which means that in equilibrium situation price and long-run average cost are equal; i.e. AR=LAC. Hence, the firm earns only normal profit.

Another interesting fact is noticeable at equilibrium point the firms is not making full use of its capacity. Production level is not optimum at equilibrium point. It is so because curve at its minimum point.

Comment

It should be noted that in monopolistic competition, firms earn only normal profit, in the long run as they do perfect competition. Presence of monopolistic competition does not improve their profitability. Further, on account of

i. Negatively sloping demand curves,
ii. U-shaped long term average cost curves,

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iii. Free exit and entry of firms, and
iv. Competition among firms.

They all produce below their 'optimum capacity' as the equilibrium is to the left of minimum point of the average cost curve. Some productive capacity of their remains unutilized. This increase their average cost of production which they charge from the consumers any adding them to the supply price. The firms operating under monopolistic competition also incur selling expenses which they charge from the consumers.

Similarly, the consumers also suffer in several ways.
i. They get a smaller supply compared with what the economy can produce by effectively utilizing its productive capacity.
ii. The average cost of production is more than the minimum average cost of optimum level of output and the consumers have to bear it in the form of higher prices.
iii. They also pay for the selling expenses incurred by the sellers.
iv. In the net, therefore, 'for given quality of product they pay a higher price, and for a given price they get an inferior product'.

The only possible gain to the consumers is in the form of the 'variant' of products. However, some thinkers believe that the variety does not bring in any addition of utility to the body of consumers taken together because every consumer cannot deprivation suffer a loss of utility on that account.

Oligopoly

The term oligopoly is derived from two Greek words: 'oligi' means few and 'polein' means to sell. An oligopoly is an industry dominated by a few firms, e.g. supermarkets, petrol, car industry etc. Oligopoly is a market situation in which there are a few firms selling homogeneous or differentiated products. The former is called pure or perfect oligopoly and the latter is called imperfect or differentiated oligopoly. Oligopoly is, sometimes, also known as 'competition among the few' as there are few sellers in the market and every seller influences and is influenced by the behaviour of other firms.
In India, markets for automobiles, cement, steel, aluminium, etc, are the examples of oligopolistic market. In all these markets, there are few firms for each particular product.
The main characteristics of oligopoly:
1. Few firms: Under oligopoly, there are few large firms although the exact number of firms is not defined. The market is characterised by severe competition as each firm produces a significant portion of the total output.
2. Barriers to Entry: Under oligopoly, firms can earn abnormal profits in the long-run as the market is characterised by barriers to entry (for example, patents, licenses, economies of scale requirement of large capital, control over crucial raw materials, etc) which prevent entry of new firms into the industry.
3. Non-Price Competition: Under oligopoly, firms try to avoid price competition due to the fear of price war and hence depend upon non-price methods like advertising, after sale services, warranties etc. in order to influence demand and build brand recognition.

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4. Interdependence: As under oligopoly, there are few firms that hold a significant share in total output of the industry, each firm is affected by the price and output decisions of rival firms. It is in this sense that
there is huge interdependence among firms in oligopoly.Therefore, a firm takes into account the action and reaction of its competing firms while determining its price and output levels.
5. Nature of the Product: The product of the firms under oligopoly may be either homogeneous or differentiated.
6. Selling Costs: Under oligopoly, firms try to avoid price competition and indulge in non-price competition Oli As there is severe competition and huge interdependence in oligopoly markets, selling cost are important for competing against the rival firms for the larger market share.
7. No unique pattern of pricing behaviour: Under oligopoly, firms want to act independently and earn maximum profit on the one hand and they want to cooperate with rivals to remove uncertainty on the other hand. Depending upon their different motives, there may be various situations emerging in real life and hence it is not possible to predict anyunique pattern of pricing behaviour among the firms in oligopoly markets. The firms may either compete with others or collude with others leading to different pricing situations.
8. ndeterminateness of Demand Curve: Unlike other market structures, it is not possible to determine demand curve ofa firmunder oligopoly. It is so because on the one hand, there is huge interdependence among rival firms and on the other hand, there is uncertainty regarding the reaction of rivals. The rivals may react in different ways when a firm changes its price and that renders the demand curve of a firm indeterminate.

Firms' Behavior under Oligopoly

Depending upon the objectives of the firms, magnitude of barriers to entry and nature of government regulation, there may be different possible outcomes in relation to firms' behaviour under oligopoly. These are as follows:
1. Stable prices (e.g. through kinked demand curve)
2. Price wars (competitive oligopoly)
3. Collusion for higher prices.

Broadly, we can say that oligopoly may either be collusive or it may be non-collusive. A collusive oligopoly is a market situation wherein the firms cooperate with each other in determining price or output or both. A non collusive oligopoly refers to a market situation wherein thefirms in an oligopoly market compete with each other rather than co-operating.
In view of the fact there are various models of firms' behavior under oligopoly, we shall restrict our discussion to one model namely, kinked demand curve model (non-collusive oligopoly).

1. Non-Collusive Oligopoly-Sweezy's Kinked Demand Curve Model (Price-Rigidity*):*

Price rigidities are often observed in oligopolistic markets. Paul Sweezy in 1939 used unconventional demand
curve called as kinked demand curve to explain these rigidities in oligopoly markets.

Reason for the kink in demand curve:

Under the present model, it is assumed that firms behave in two-fold manner (asymmetric behavioural pattern) in reaction to a price change by a rival firm. In simple words, the asymmetric behavioural pattern is that firms follow price cuts by a rival but firms do not follow price increases. In other words, if a seller increases its price, its rivals will not follow the price increase and the market share of this firm will reduce significantly as a result of higher price compared to rivals (the demand curve corresponding to price increase would be relatively elastic

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as small increase in price will reduce demand of this firm significantly). Contrarily, if a seller reduces its price, its rivals will also reduce their price atleast equal to the price reduction by this firm in order to prevent their market share from falling. The firm lowering the price initially will not be able to gain from price reduction due to

reaction of its rivals(the demand curve corresponding to price decrease would be relatively inelastic as this firm will not be able to increase its demand much by reducing its price). Two different types of elasticities corresponding to different types of reaction by rival firms result in a kind in demand curve of a firm in oligopoly markets.

Why price rigidity?

As is clear from the above, any firm cannot gain or it can even lose by changing its price from the prevailing price in the market. Neither increase nor decrease in rpice would result in increase in demand for the firm changing its

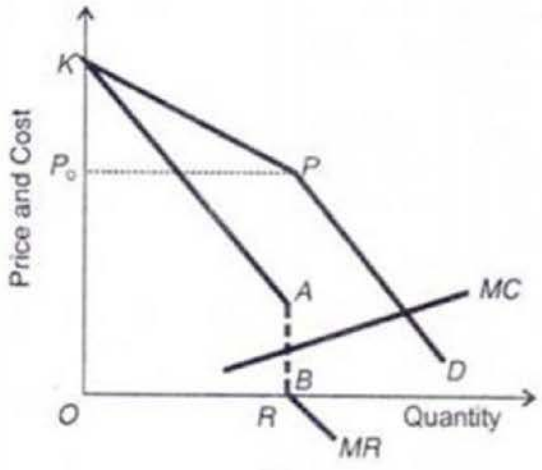
price. It leads to firms sticking to the same price over time and hence results in price rigidity under oligopoly.

does not go beyond the AB.

2. Collusive Oligopoly

Kinked demand curve model is based on the assumption that oligopoly firms though interdependent in the market decide to act independently. But there is another possibility that firms may try to remove uncertainty related to acting independently by entering into pricing agreements with each other. Such an agreement is called collusion. A collusion may be formal or informal. Generally, a collusion may take the form of cartel or price leadership. Cartel refers to an association of independent firms, within the same industry, that follow the common

policies relating to price, output, sale, profit maximisation and distribution of products. Price leadership is based on tacit or informal collusion. Under price leadership, one firm that may be a large or dominant firm acts as the price leader and fixes the price for the product while other firms follow.



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SUMMARY

The concept of a market is central to the understanding of the determination of price and quantity of output of a commodity under consideration. Market means the general field within which, the force determining the price of particular product operate

– The market consists of two components:
– A Firm
– An Industry

– There are various kinds of markets prevailing in the economy.
– Perfect Competition has following characteristics:
– Large Number of Sellers and Buyers
– Homogeneous Product
– Free Entry and Exit
– Firm is a price taker
– Full Knowledge of Market
– Economic Rationality
– No Transportation Cost

– The perfect competition firm is in equilibrium when MC= MR and MC cuts the Mr curve from below.

– Monopoly
– Monopoly means a single seller and large number of buyers
– No close substitute
– A single firm industry
– Monopolist is free to fix a price of his choice. Firm is price maker.
– Irrespective of the profit income of the existing producer firm, new firms cannot enter the industry
– A buyer will buy it only if its price does not exceed its marginal utility to him
– The equilibrium for monopolist is at a point where MR= MC.

– One of the important features of the monopolist is price discrimination, where he charges different prices for homogeneous product to different consumers.

– Monopolistic Competition
– Monopolistic Competition means large number of sellers and buyers
– Close substitutes
– All firms are monopolists of their differentiated product
– The main feature is product differentiation and selling expenses comprising of marketing costs.

– Oligopoly
– A few sellers and large number of buyers
– Homogeneous and differentiated Products

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Some Important terms

Profit Maximizing condition The necessary condition is marginal revenue equal to marginal cost. The sufficientcondition is marginal cost curve is intersecting the marginal revenue curve from below.

Economic Profits Difference between total revenue and total cost incurred on inputs.

Normal Profits When total revenue and total cost equals. Normal Profits = Zero Economic Profits

Homogeneous Products Two or more products that are identical in every possible respect.

Short RunEquilibrium A competitive firm attains short run equilibrium when MR= SMC with SMC rising.

Long Run Equilibrium A competitive firm attains long run equilibrium when MR= LMC with LMC rising and P=AR=LAC.

Break Even Condition When total sale proceeds covers total costs of production.

Shut Down Condition When price of the good falls below the average variable costs. If the price of the firm is such that it is not even able to cover its variable costs, the firm should shut down.

Degree of Monopoly Monopoly power is the degree of power held by the monopolist to set the price for a good.

Price Discrimination When the similar product is sold to different consumers at different prices.

Product Differentiation Slight differences that exist between two or more goods that are essentially the same and which satisfy the same basic want or need. This is generally pursued in monopolistic competition.

Selling Costs All expenditures pertaining to selling activities after the product has been produced. An important component is advertising and other sales promotion expenditures including giving free gifts and other promotional activities

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OBJECTIVE QUESTIONS

1. Which of the following is not an essential condition of pure competition?

(a) Large number of buyers and sellers
(b) Homogeneous product
(c) Freedom of entry
(d) Absence of transport cost

2. Under which of the following forms of market structure does a firm has no control over the price of its product.

(a) Monopoly
(b) Oligopoly
(c) Monopolistic competition
(d) Perfect competition

3. Given the relation MR=P$\left(1-\frac{1}{e}\right)$ if e> 1, then

(a) MR >0
(b) MR <0
(c) MR = 0
(d) None

4. Profits of the firm will be more at:

(a) MR = MC
(b) Additional revenue from extra unit equals its additional cost
(c) Both of above
(d) None

5. What should firm do when Marginal revenue is greater than marginal cost?

(a) Firm should expand output
(b) Effect should be made to make them equal
(c) Prices should be covered down
(d) All of these

6. Under monopoly price discrimination depends upon:

(a) Elasticity of demand for commodity
(b) Elasticity of supply for commodity
(c) Size of market
(d) All of above

7. Firms in a monopolistic market are price _____:

(a) Takers
(b) Givers
(c) Makers
(d) Acceptors

8. Market which have two firms are known as:

(a) Oligopoly
(b) Duopoly
(c) Monopsony
(d) Oligopsony

9. Monopolist can determine:

(a) Price
(b) Output
(c) Either price or output
(d) None

10. MR of n th unit is given by:

(a) TR_n / TR_{n-1}
(b) $TR_n + TR_{n-1}$
(c) $TR_n - TR_{n-1}$
(d) All of these

11. The market structure in which the number of sellers is small and there is inter dependence in decision making by the firms is known as:

(a) Perfect competition
(b) Oligopoly
(c) Monopoly
(d) Monopolistic competition

12. In perfect competition firm is a price taker, the _____ curve is a straight line:

(a) Marginal cost
(b) Total cost
(c) Total revenue
(d) Marginal revenue

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13. Given the relation MR=P (1- $\frac{1}{e}$). If e<1, then

(a) MR < 0
(b) MR >0
(c) MR = 0
(d) None of these

14. For maximum profit, the condition is:

(a) AR = AC
(b) MR = MC
(c) MR = AR
(d) MC = AC

15. Equilibrium price may be determined through:

(a) Only demand
(b) Only supply
(c) Both demand & supply
(d) None

16. If price is forced to stay below equilibrium price:

(a) Excess supply exists
(b) Excess demand exists
(c) Either (a) or (b)
(d) Neither (a) nor (b)

17. An increase in supply with unchanged demand lead to :

(a) Rise in price and fall in quantity
(b) Fall in both price and quantity
(c) Rise in both price and quantity
(d) Fall in price and rise in quantity

18. In the long run:

(a) Only demand can change
(b) Only supply can change
(c) Both demand and supply can change
(d) None of these

19. Condition for producer equilibrium is:

(a) TR = TC
(b) MC = MR
(c) TC = TSC
(d) None of these

20. An increase in supply with demand remaining the same, brings about.

(a) An increase in equilibrium quantity and decrease in equilibrium price
(b) An increase in equilibrium price and decrease in equilibrium quantity
(c) Decrease in both equilibrium price and quantity
(d) None of these

21. A competitive firm in the short run incurs losses. The firm continues production, if:

(a) P > AVC
(b) P = AVC
(c) P< AVC
(d) P >= AVC

22. Under ____ market condition, firm make normal profits in the long run:

(a) Perfect competition
(b) Monopoly
(c) Oligopoly
(d) None

23. A monopolist is able to maximize his profits when:

(a) His output is maximum
(b) He charges a high price
(c) His average cost is minimum
(d) His marginal cost is equal to marginal revenue

24. Under monopolistic competition the cross elasticity of demand for the product of a single firm would be:

(a) Infinite
(b) Highly elastic
(c) Highly inelastic
(d) Zero

25. When AR= ₹10 and AC= ₹8 the firm makes _____:

(a) Normal profit
(b) Net profit
(c) Gross profit

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(d) Supernormal profit

26. What are the conditions for the long run equilibrium of the competitive firm?

(a) LMC = LAC = P
(b) SMC = SAC = LMC
(c) P = MR
(d) All of these

27. Kinked demand curve hypothesis is given by:

(a) Alfred marshal
(b) A.C Pigou
(c) Sweezy
(d) Hicks & allen

28. Supernormal profits occur, when :

(a) Total revenue is equal to total cost
(b) Total revenue is equal to variable cost
(c) Average revenue is more than average cost
(d) Average revenue is equal to average cost

29. If the perfect competition, the price line lies below the average cost curve, the firm would:

(a) Make only Normal profits
(b) Incur losses
(c) Make abnormal profit
(d) Profit cannot be determined

30. The MR curve cuts the horizontal line between Y axis and demand curve into :

(a) Two unequal parts
(b) Two equal parts
(c) May be equal or unequal parts
(d) None of these

31. Competitive firm in the long run earn:

(a) Super normal profit
(b) Normal profit
(c) Losses
(d) None

32. For a monopolist, the necessary condition for equilibrium is:

(a) P = MC
(b) P = MR = AR
(c) MR = MC
(d) None

33. A firm will shut down in the short run if:

(a) If is suffering a loss
(b) Fixed costs exceeds revenue
(c) Variable costs exceed revenue
(d) Total costs exceed revenue

34. _____ is the price at which demand for a commodity is equal to its supply:

(a) Normal price
(b) Equilibrium price
(c) Short run price
(d) Secular price

35. _____ is a ideal Market.

(a) Monopoly
(b) Monopolistic
(c) Perfect competition
(d) Oligopoly

36. Under which Market situation demand curve is linear and parallel to X axis:

(a) Perfect Competition
(b) Monopoly
(c) Monopolistic Competition
(d) Oligopoly

37. Which market have characteristic of product differentiation?

(a) Perfect Competition
(b) Monopoly
(c) Monopolistic Competition
(d) None

38. Which of these are characteristic of perfect Competition.

(a) Many Sellers & Buyers
(b) Homogeneous Product
(c) Free Entry and Exit
(d) All of the above

39. MR Curve = AR = Demand Curve is a feature of which kind of Market?

(a) Perfect Competition
(b) Monopoly
(c) Monopolistic
(d) Oligopoly

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40. In the long-run monopolist can
- **(a)** Incur losses
- **(b)** Must earn super normal profits
- **(c)** Wants to shut- down
- **(d)** Earns only normal profits.

41. The demand curve of the firm and industry will be same in which form of market:
- **(a)** Monopoly Competition
- **(b)** Perfect Competition
- **(c)** Monopoly
- **(d)** Oligopoly

42. Oligopoly having identical products is:
- **(a)** Pure oligopoly
- **(b)** Imperfect oligopoly
- **(c)** Price leadership
- **(d)** Collusion

43. The demand curve of oligopoly is:
- **(a)** Horizontal
- **(b)** Vertical
- **(c)** Kinked
- **(d)** Rising left to right

44. Demand curve is equal to M.R curve in which market?
- **(a)** Oligopoly
- **(b)** Monopoly
- **(c)** Monopoly Competition
- **(d)** Perfect Competition

45. Kinkeddemand hypothesis is designed to explain _____ in context to oligopoly.
- **(a)** Price and Output Determination
- **(b)** Price Rigidity
- **(c)** Collusion between Firm
- **(d)** All of the above

46. Price discrimination can take place only in _____.
- **(a)** Monopolistic Competition
- **(b)** Oligopoly
- **(c)** Perfect competition
- **(d)** Monopoly

47. In oligopoly, the kind on the demand curve is more due to _____
- **(a)** Discontinuity in MR.
- **(b)** Discontinuity in AR.
- **(c)** Fulfillment of the assumption that a price cut is followed by others and a price increase by a firm is not followed by others.
- **(d)** Price war amongst the firms.

48. Price Discrimination is possible only when.
- **(a)** Seller is alone
- **(b)** Goods are homogeneous
- **(c)** Market is controlled by the government
- **(d)** None of the above

49. Which of the following is not the feature of an imperfect competition?
- **(a)** Product differentiation
- **(b)** Few sellers
- **(c)** Homogeneous products
- **(d)** Price wars

50. Price taker firm_____
- **(a)** Do not advertise their product because it misleads the customers
- **(b)** Advertise their products to boost the level of demand
- **(c)** Do not advertisement but given gifts along with the sold items to attract customers
- **(d)** Do not advertise because they can sell as much as they wish at the prevailing price.

51. Price rigidity is a situation found in which of the following market forms?
- **(a)** Perfect competition
- **(b)** Monopoly
- **(c)** Monopolistic competition
- **(d)** Oligopoly

52. When elasticity of demand is Equal to one in monopoly, marginal Revenue will be _____.
- **(a)** Equal to one
- **(b)** Greater than one
- **(c)** Les than one
- **(d)** Zero.

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53. Which one of the following statement is incorrect?
- **(a)** Competitive firms are price takers and not price makers
- **(b)** Price discrimination is possible in monopoly only
- **(c)** Duopoly may lead to monopoly
- **(d)** Competitive firm always seeks to discrimination

54. Under which of the following market structure AR of the firm will be equal to MR?
- **(a)** Monopoly
- **(b)** Monopolistic competition
- **(c)** Oligopoly
- **(d)** Perfect competition

55. Tooth paste industry is an example of _____.
- **(a)** Monopoly
- **(b)** Monopolistic competition
- **(c)** Oligopoly
- **(d)** Perfect competition

56. OPEC is an example of :
- **(a)** Monopolistic competition
- **(b)** Monopoly
- **(c)** Oligopoly
- **(d)** Duopoly

57. Monopolistic Competitive firms _____.
- **(a)** Are small in size
- **(b)** Have small share in total market
- **(c)** Are very large in size
- **(d)** Both (A) and (B)

58. The price discrimination under monopoly will be possible under which of the following conditions?
- **(a)** The seller has no control over the supply of his product
- **(b)** The market has the same condition all over
- **(c)** The price elasticity of demand is different in different markets
- **(d)** The price elasticity of demand is uniform.

59. Oligopoly having identical products is known as _____.
- **(a)** Pure oligopoly
- **(b)** Collusive oligopoly
- **(c)** Independent oligopoly
- **(d)** None of these

60. Which of these is the best example of oligopoly?
- **(a)** OPEC
- **(b)** SAARC
- **(c)** WTO
- **(d)** GATT

61. Monopolist can fix price of goods whose elasticity is _____.
- **(a)** Less than 1
- **(b)** More than 1
- **(c)** both
- **(d)** none

62. Kinked demand curve is observed in _____.
- **(a)** Duopoly market
- **(b)** Monopoly market
- **(c)** Competitive market
- **(d)** Oligopoly market

63. Perfectly competitive firm faces:
- **(a)** Perfectly elastic demand curve
- **(b)** Perfectly inelastic demand curve
- **(c)** Zero
- **(d)** Negative

64. In perfect competition when the firm is a price taker, which curve among the following will be a straight line?
- **(a)** Marginal cost
- **(b)** Average cost
- **(c)** Total cost
- **(d)** Marginal Revenue

65. "Price Discrimination" can be best exercise by the Seller in _____
- **(a)** Oligopoly
- **(b)** Monopoly
- **(c)** Monopolistic competition
- **(d)** Perfect competition

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66. In Oligopoly the kink in the demand curve is more due to _____.

(a) Discontinuity in MR

(b) Discontinuity in AR

(c) Fulfillment of the assumption that a price fall is followed by the other and a price increase by a firm is not followed by the other

(d) Price war among the firms

67. A firm Encounters "shut down" point when _____.

(a) Marginal cost Equals the price of the profit maximising level of out put

(b) Average fixed cost Equals the price at the profit maximising level of output

(c) Average Variable cost Equals the price at the profit maximising level of output

(d) Average Total cost Equals the price at the profit maximising level of output

68. Under which market Condition firms make only normal profit in the long run?

(a) Oligopoly

(b) Monopoly

(c) Monopolistic competition

(d) Duopoly

69. In Monopolistic competitive excess capacity in the firm _____.

(a) Always Exists

(b) Sometimes Exists

(c) Never Exists

(d) None of the above

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ANSWERS

1	(d)	**2**	(d)	**3**	(a)	**4**	(c)	**5**	(a)	**6**	(d)	**7**	(c)
8	(b)	**9**	(a)	**10**	(c)	**11**	(b)	**12**	(d)	**13**	(a)	**14**	(b)
15	(c)	**16**	(b)	**17**	(d)	**18**	(c)	**19**	(b)	**20**	(a)	**21**	(a)
22	(b)	**23**	(d)	**24**	(d)	**25**	(d)	**26**	(d)	**27**	(c)	**28**	(d)
29	(b)	**30**	(b)	**31**	(b)	**32**	(c)	**33**	(c)	**34**	(b)	**35**	(c)
36	(a)	**37**	(c)	**38**	(d)	**39**	(a)	**40**	(b)	**41**	(c)	**42**	(a)
43	(c)	**44**	(b)	**45**	(d)	**46**	(d)	**47**	(c)	**48**	(a)	**49**	(c)
50	(d)	**51**	(d)	**52**	(d)	**53**	(d)	**54**	(d)	**55**	(b)	**56**	(c)
57	(d)	**58**	(c)	**59**	(a)	**60**	(a)	**61**	(a)	**62**	(d)	**63**	(a)
64	(d)	**65**	(b)	**66**	(c)	**67**	(c)	**68**	(c)	**69**	(a)		

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CHAPTER 5 INDIAN ECONOMICS

INTRODUCTION

With 1.3 billion people and the **world's fourth-largest economy in terms of PPP and seventh in terms of size**, India's recent growth and development has been one of the most significant achievements of our times. Over the six and half decades since independence, the country has brought about a landmark agricultural revolution that has transformed the nation from chronic dependence on grain imports into a global agricultural powerhouse that is now a net exporter of food. Life expectancy has more than doubled, literacy rates have quadrupled, health conditions have improved. India will soon have the largest and youngest workforce the world has ever seen. At the same time, the country is in the midst of a massive wave of urbanization as some 10 million people move to towns and cities each year in search of jobs and opportunity. It is the largest rural-urban migration of this century. Massive investments will be needed to create the jobs, housing, and infrastructure to meet soaring aspirations and make towns and cities more livable and green.There is a continuing debate on whether India's economic expansion has been pro-poor or anti-poor. Studies suggest that the economic growth has been pro-poor and has reduced poverty in India.

FIVE YEAR PLAN AND PLANNING COMMISSION

After India achieved Independence, a formal model of planning was adopted, and accordingly the Planning Commission, reporting directly to the Prime Minister of India, was established on 15 March 1950, with Prime Minister Jawaharlal Nehru as the Chairman. Authority for creation of the Planning Commission was not derived from the Constitution of India or statute; it is an arm of the Central Government of India

Organization

The composition of the Commission underwent considerable changes since its initiation. With the Prime Minister as the *ex officio* Chairman, the committee had a nominated Deputy Chairman, with the rank of a full Cabinet Minister. Cabinet Ministers with certain important portfolios acted as *ex officio* members of the Commission, while the full-time members were experts in various fields like economics, industry, science and general administration. Ex *officio* members of the Commission included the Finance Minister, Agriculture Minister, Home Minister, Health Minister, Chemicals and Fertilizers Minister, Information Technology Minister, Law Minister, Human Resource Development Minister and Minister of State for Planning.

The Commission worked through its various divisions, which there were two kinds:

_ General Planning Divisions

_ Programmed Administration Divisions

The majority of the experts in the Commission were economists, making the Commission the biggest employer of the Indian Economic Service.

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FUNCTIONS

The Indian Planning Commission's functions as outlinedby the Government's 1950 resolution are following:

1. To make an assessment of the material, capital and human resources of the country, including technical personnel, and investigate the possibilities of augmenting those are related resources which are found to be deficient in relation to the nation's requirement.
2. To formulate a plan for the most effective and balanced utilization of country's resources.
3. To define the stages, on the basis of priority, in which the plan should be carried out and propose the allocation of resources for the due completion of each stage.
4. To indicate the factors that tend to retard economic development.
5. To determine the conditions which need to be established for the successful execution of the plan within the incumbent socio-political situation of the country
6. To determine the nature of the machinery required for securing the successful implementation of each stage of the plan in all its aspects.
7. To appraise from time to time the progress achieved in the execution of each stage of the plan and also recommend the adjustments of policy and measures which are deemed important vis-a-vis a successful implementation of the plan.
8. To make necessary recommendations from time to time regarding those things which are deemed necessary for facilitating the execution of these functions. Such recommendations can be related to the prevailing economic conditions, current policies, measures or development programmers. They can even be given out in response to some specific problems referred to the commission by the central or the state government

NITI AAYOG

National Institution for Transforming India is a Government of India policy think-tank established by the Narendra Modi government to replace the Planning Commission which followed the top-down model. The stated aim for NITI Aayog's creation is to foster involvement and participation in the economic policy-making process by the State Governments of India. The emphasis is on bottom up approach and make the country to move towards cooperative federalism. The Union Government of India announced the formation of NITI Aayog **on 1 January2015,** and the first meeting was held on 8 February2015. The Prime Minister serves as the Ex-officio chairman. The governing council consists of all state Chief Ministers, Lieutenant Governors of union territories, and vice chairman nominated by the Prime Minister. In addition to full members, there are two part-time members and four ex-officio members and a chief executive officer. The temporary members are selected from the leading universities and research institutions

The NITI Aayog comprises the following:

1. Prime Minister of India as the Chairperson

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2. A Governing Council composed of Chief Ministers of all the States and Union territories with Legislatures and lieutenant governors of other Union Territories.
3. Regional Councils composed of Chief Ministers of States and Lt. Governors of Union Territories in the region to address specific issues and contingencies impacting more than one state or a region.
4. Full-time organizational framework composed of a Vice-Chairperson, three full-time members, two part-time members (from leading universities, research organizations and other relevant institutions some ex-officio capacity), four ex-officio members of the Union Council of Ministers, a Chief Executive Officer (with the rank of Secretary to the Governmentof India) who looks after administration, and a secretariat, Experts and specialists in various fields

Five-Year Plans (FYPs)

First Plan (1951–1956)

The first Indian Prime Minister, Jawaharlal Nehru presented the First Five-Year Plan to the Parliament of India and needed urgent attention. The First Five-year Plan was launched in 1951 which mainly focused in development of the primary sector. The First Five-Year Plan was based on the **Harrod–Domar model with few modifications.** The target growth rate was 2.1% annual gross domestic product (GDP) growth; the achieved growth rate was3.6% the net domestic product went up by 15%. The monsoon was good and there were relatively high crop yields, boosting exchange reserves and the per capita income, which increased by 8%. National income increased more than the per capita income due to rapid population growth. Many irrigation projects were initiated during this period, including the Bhakra, Hirakud and Damodar Valley dams. The World Health Organization(WHO), with the Indian government, addressed children's health and reduced infant mortality, indirectly contributing to population growth. At the end of the plan period in 1956, five Indian Institutes of Technology (IITs) were started as major technical institutions. The University Grants Commission(UGC) was set up to take care of funding and take measures to strengthen the higher education in the country.Contracts were signed to start five steel plants, which came into existence in the middle of the Second Five-Year Plan. The plan was quasi successful for the government.

Second Plan (1956–1961)

The Second Plan was particularly in the development of the public sector and "rapid Industrialization". The plan followed the **Mahalanobis model,** an economic development model developed by the Indian statistician Prasanta Chandra Mahalanobis in 1953. The plan attempted to determine the optimal allocation of investment between productive sectors in order to maximize long-run economic growth. It used the prevalent state of art techniques of operations research and optimization as well as the novel applications of statistical models developed at the Indian Statistical Institute. The plan assumed a closed economy in which the main trading activity would be centered on importing capital goods. Hydroelectric power projects and **five steel plants at Bhilai, Durgapur, and Rourkela were established with the help of Russia, Britain**

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(the U.K) and West Germany respectively. Coal production was increased. More railway lines were added in the north east. The Tata Institute of Fundamental Research and Atomic Energy Commission (AEC) was established as research institutes.

Third plan (1961-1966)

The Third Five-year Plan, known as "Gadgil Yojna",stressed agriculture and improvement in the production of wheat, but the brief Sino-Indian War of 1962 exposed weaknesses in the economy and shifted the focus towards the defence industry and the Indian Army. In 1965–1966, India fought a War with Pakistan. There was also a severe drought in 1965. The war led to inflation and the priority was shifted to price stabilisation. The construction of dams continued. Many cement and fertilizer plants were also built. Punjab began producing an abundance of wheat. Many primary schools were started in rural areas. In an effort to bring democracy to the grass-root level, Panchayat elections were started and the states were given more development responsibilities. State electricity boards and state secondary education boards were formed. States were made responsible for secondary and higher education. State road transportation corporations were formed and local road building became a state responsibility.

The target growth rate was 5.6%, but the actual growth was 2.4%

Three annual plans (1966-1969)

Due to miserable failure of the Third Plan the government was forced to declare "plan holidays" (from 1966–67, 1967–68, and 1968–69). Three annual plans were drawn during this intervening period. During 1966–67there was again the problem of drought. Equal prioritywas given to agriculture, its allied activities, and industrial sector. The government of India declared "Devaluation of Rupee" to increase the exports of the country.The main reasons for plan holidays were the war, lack ofresources, and increase in inflation after that plan holiday was created.

Fourth Plan (1969–1974)

At this time Indira Gandhi was the Prime Minister. The Indira Gandhi government nationalised14 major Indian banks and the Green Revolution in India advanced agriculture .In addition, the situation in East Pakistan (now Bangladesh) was becoming dire as the Indo-Pakistan War of 1971 and Bangladesh Liberation War took funds ear marked for industrial development. India also performed the Smiling Buddha underground nuclear test (Pokhran-1) in Rajasthan on May 18, 1974, partially in response to the United States deployment of the Seventh Fleet in the Bay of Bengal. The fleet had been deployed to warn India against attacking West Pakistan and extending the war. The target growth rate was 5.6%, but the actual growth rate was 3.3%.

Fifth Plan (1974–1978)

The Fifth Five-Year Plan laid stress on employment ,poverty alleviation (Garibi Hatao), and justice. The plan also focused on self-reliance in agricultural production and defence. In 1978 the newly elected Morarji Desai government rejected the plan. The Electricity Supply Act was amended in 1975, which enabled the central government to enter into power generation and transmission.The Indian national highway system was introduced and many roads were widened

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to accommodate the increasing traffic. Tourism also expanded. The twenty-point programme was launched in 1975. It was followed from1974 to 1979.The Minimum Needs Programme (MNP) was introduced in the first year of the Fifth Five Year Plan (1974–78).The objective of the programme is to provide certain basic minimum needs and thereby improve the living standards of the people. The target growth rate was 4.4% and the actual growth rate was 4.8%.

Rolling Plan (1978–1980)

The Janata Party government rejected the Fifth Five-Year Plan and introduced a new Sixth Five-Year Plan (1978–1980). This plan was again rejected by the Indian National Congress government in 1980 and a new Sixth Plan was made.The Rolling Plan consists of three kind of plans that were proposed. The First Plan is for the present year which comprises the annual budget and Second is a plan for a fixed number of years, which may be 3, 4 or 5 years .Plan number two is kept changing as per the requirements of the Indian economy. The Third Plan is a perspective plan which is for long terms i.e. for 10, 15 or 20 years. Hence there is no fixation of dates in for the commencement and termination of the plan in the rolling plans.

Sixth Plan (1980–1985)

The Sixth Five-Year Plan marked the beginning of economic liberalisation. Price controls were eliminated and ration shops were closed. This led to an increase in food prices and an increase in the cost of living.This was the end of Nehruvian socialism. The National Bank for Agriculture and Rural Development was established for development of rural areas on 12 July1982 by recommendation of the Shivaraman Committee .Family planning was also expanded in order to prevent overpopulation.

In contrast to China's strict and binding one-child policy, Indian policy did not rely on the threat of force . More prosperous areas o of India adopted family planning more rapidly than less prosperous areas, which continued to have a high birth rate.The Sixth Five-Year Plan was a great success to the Indian economy. The target growth rate was 5.2% and the actual growth rate was 5.7%.The only Five-Year Plan which was done twice.

Seventh Plan (1985–1990)

The Seventh Five-Year Plan marked the comeback of the Congress Party to power. The plan laid stress on improving the productivity level of industries by upgrading The main objectives of the Seventh Five-Year Plan were to establish growth in areas of increasing economic productivity ,production of food grains, and generating employment through "Social Justice". The thrust areas of the Seventh Five-Year Plan were: social justice, removal of oppression of the weak, using modern technology, agricultural development, anti-poverty programmes, full supply of food ,clothing, and shelter, increasing productivity of small land large-scale farmers, and making India an independent economy .Based on a 15-year period of striving towards steady growth, the Seventh Plan was focused on achieving the prerequisites of self-sustaining growth by the year 2000.The plan expected the labour force to grow by 39 million people and employment was expected to grow at the rate of 4% per year.

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Under the Seventh Five-Year Plan, India strove to bring about a self-sustained economy in the country with valuable contributions from voluntary agencies and the general populace. The target growth rate was 5.0% and the actual growth rate was 6.01%.

Annual Plans (1990–1992)

The Eighth Plan could not take off in 1990 due to thefast changing political situation at the centre and the years1990–91 and 1991–92 were treated as Annual Plans. TheEighth Plan was finally formulated for the period 1992–1997.

Eighth Plan (1992–1997)

In 1991,India faced a crisis in foreign exchange (forex) reserves ,left with reserves of only about US$1 billion. Thus, under pressure, the country took the risk of reforming the socialist economy. P.V. Narasimha Rao was the tenth Prime Minister of the Republic of India and head of Congress Party, and led one of the most important administrations in India's modern history, overseeing a major economic transformation and several incidents affecting national security. At that time Dr. ManmohanSingh(later Prime Minister of India) launched India's free market reforms that brought the nearly bankrupt nation back from the edge. It was the beginning of liberalization, privatisation and globalization (LPG) in India. Modernization of industries was a major highlight of the Eighth Plan. Under this plan, the gradual opening of the Indian economy was undertaken to correct the burgeoning deficit and foreign debt. Meanwhile, India became a member of the World Trade Organization on 1 January1995. The major objectives included, controlling population growth, poverty reduction, employment generation, strengthening the infrastructure, institutional building ,tourism management, human resource development, involvement of Panchayati rajs, Nagar Palikas, NGOs, decentralization and people's participation. Energy was given priority with 26.6% of the outlay.The target growth rate was 5.6% and the actual growth rate was 6.8%..

Ninth Plan (1997–2002)

The Ninth Five-Year Plan came after 50 years of Indian Independence. Atal Bihari Vajpayee was the Prime Minister of India during the Ninth Five-Year Plan. The Ninth Five-Year Plan tried primarily to use the latent and unexplored economic potential of the country to promote economic and social growth. It offered strong support to the social spheres of the country in an effort to achieve the complete elimination of poverty. The satisfactory implementation of the Eighth Five-Year Plan also ensured the states' ability to proceed on the path of faster development. The Ninth Five-Year Plan also saw joint efforts from the public and the private sectors in ensuring economic development of the country. In addition, the Ninth Five-Year Plan saw contributions towards development from the general public as well as governmental agencies in both the rural and urban areas of the country.

New implementation measures in the form of Special Action Plans (SAPs) were evolved during the Ninth Five-Year Plan to fulfill targets within the stipulated time with adequate resources. The SAPs covered the areas of social infrastructure, agriculture, information technology and Water policy. Target growth rate was 6.5% and achieved was 5.35%

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Tenth Plan (2002–2007)

The main objectives of the Tenth Five-Year Plan were to attain 8% GDP growth per year, reduction of poverty rate by 5% by 2007,providing gainful and high-quality employment at least to the addition to the labor force , reduction in gender gaps in literacy and wage rates by at least 50% by 2007,20-point program was introduced, Target growth: 8.1% – growth achieved: 7.7%. The tenth plan was expected to follow a regional approach rather than sectoral approach to bring down regional inequalities.

Eleventh Plan (2007–2012)

- Rapid and inclusive growth.(Poverty reduction)
- Emphasis on social sector and delivery of service therein.
- Empowerment through education and skill development.
- Reduction of gender inequality.
- Environmental sustainability.
- To increase the growth rate in agriculture, industry and services to 4%,10% and 9% respectively.
- Reduce Total Fertility Rate to 2.1
- Provide clean drinking water for all by 2009.
- Increase agriculture growth to 4%.

Twelfth Plan (2012–2017)

The Twelfth Five-Year Plan of the Government of India has been decided to achieve a growth rate of 8.2% but the National Development Council (NDC) on 27 December2012 approved a growth rate of 8% for the Twelfth Five-Year Plan. With the deteriorating global situation, the Deputy Chairman of the Planning Commission Montek Singh Ahluwalia has said that achieving an average growth rate of 9 percent in the next five years is not possible. The Final growth target has been set at 8% by the endorsement of the plan at the National Development Council meeting held in New Delhi." It is not possible to think of an average of 9% [in the12th plan]. I think somewhere between 8 and 8.5 percentis feasible," Ahluwalia said on the sidelines of a conference of State Planning Boards and departments. The approached paper for the 12th Plan, approved last year, talked about an annual average growth rate of 9%.

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For an overview of the Indian economy, the first step is to discuss the basic characteristics i.e., key macroeconomic indicators of the economy. These are as follows:

(a) National Income:

Income is probably the most frequently used term in economics, used by experts and lay men. Income level is the most commonly used tool to determine the well-being and happiness of nations and their citizens. This remains true even today, even if we know that 'income' is not an exhaustive idea to know about the well-being of the society. Hence, a brief study, of the trend of the national income in India is very much essential for attaining a clear understanding about the impact of various plans and economic reforms on the Indian economy.

In general, income of an economy is measured through Gross Domestic Product (GDP).

b) Sectoral Employment in India: The question arises: Did this structural shift in GDP share composition have an impact on the employment pattern or distribution of workforce in India. The various rounds of the National Sample Survey reveals that the share of workforce deployed in agriculture declined from 68 per cent in 1983 to 53.2 per cent in 2009-10. Along with this share of employment in industry increased from 13.9 per cent in 1983 to 21.5 per cent 2009-10. During the same period the share of services in total employment increased from 18.2 per cent to 25.4 per cent.

C .Capital Formation: Capital formation is an important step towards economic development of a country. Insufficiency of capital is considered as an important limiting factor in case of the underdeveloped or developing economies. Hence, both the amount of production and its composition largely depend on the amount of capital available in the country. Capital formation includes physical (machines, tools, instruments, etc.) as well as human (knowledge, skill, health etc.) capital.

D. **Foreign Trade:** During the **pre-British period**, India was famous for **her textile and handicrafts** exports. During the British period, gradually pattern of India's trade changed and it became an exporter of raw materials and importer of British machine made goods. But during the post-independence period, India experienced a thorough change in the composition and direction of foreign trade. In the post-economic reforms period, a good number of non-traditional commodities have got included in the export list of the country. The direction of trade has also changed remarkably. Since the introduction of **five-year planning** system in the country, India had to depend heavily on the imports of various types of **machineries and equipment** for the development of various types of industries in the country. Such imports were known as **developmental imports**. At that stage, India had to import capital goods extensively in order to set up various industries, **plants, locomotives, hydro-electric projects etc**. In the next stage, India had to import a huge quantity **of intermediate goods and raw materials in** order to utilize the productive capacity developed in the initial period of planning. These types of imports were known as **maintenance imports**. Thus foreign trade has been helping the country in different stages of its economic development.

The top ten destination countries for Indian exports, viz. **UAE, USA, Singapore, China, Hong Kong, Netherlands, Saudi Arabia, UK, Germany and Japan**, remained more or less the same during the last four years except for some minor change in relative positions here and there. These ten countries together accounted for a share of more than 50% of our total exports. The major items in **India's export basket are Petroleum products, Engineering goods and Gems & Jewellery. These three products together contribute 50 per cent of India's exports**. India's **imports from the People's Republic of China remained consistently on top** with the percentage share of imports from China ranging between 11 and 12 per cent during 2008-09 and 2012-13. This indicates the importance of Chinese goods in Indian markets. After China **UAE, Saudi Arab, Switzerland and USA have remained the next top four major import partners** for India during 2009-10 to 2012-13. Further, **petroleum & crude oil products and pharmaceutical products have remained major components of India's import basket.**

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Basic issues of development of an economy:

Despite the fact that Indian economy has been attaining praise worthy progress in terms of growth rate, India is still considered as a low income developing economy. A quarter of the country's population lives below poverty line. Poverty is not only acute but a chronic problem in India. At the same time, there exist un-utilised or underutilized human and natural resources. It is, therefore, quite important to understand the basic issues of developmentof an economy which is one of the poor and at the same time one of the fastest growing economies of the world.

1. Low per capita income: Developing economies are noted for existence of low per capita income. The per capita income of India in **2014 was $ 1560.** It may be noted that in the same year the average per capita Gross National Income (GNI) of **USA,** highly developed country, was **35 times that of India**. It shows that difference between the level of living of an average American and Indian was quite large and significant. Even the neighbouring **country China**, a major developing country, had an average **5 times higher per capita GNI** than
India. In case of India not only the per capita income is low but the distribution of income is also unequal. The unequal distribution of income and wealth makes the problem of poverty one of the critical and acute obstaclesin the path towards economic progress.

Per Capita Gross National Income at Market Prices -2014 (in US Dollars)
Country
USA 55,320
India 1,560
China 7,520

2. dependence of population on agriculture: Occupational distribution of population in India clearly reflects the backwardness of the economy. In India, even in **2014, about 4**7 per cent of the working population was engaged in agriculture. However, its contribution to **national income was only 17 per cent**, according to data published by the World Bank. It shows
that there is very low productivity per person in agriculture.

3. Heavy population pressure: The Indian economy is facing the problem of population explosion. It is clearly evident from the total population of India which was 121.08 crores as per 2011 census. It is the **second highest populated country, China being the first.** The main problem in India is the high level of birth rates coupled with a falling level of death rates.

4. Existence of chronic unemployment and under-employment: The huge unemployed working population is another important feature of Indian economy. In India labour is an abundant factor. As a result, it is very difficult to provide gainful employment to the entire working population. Rapid growth of population coupled with inadequate growth of secondary and tertiary occupations are responsible for the occurrence of chronic unemployment and
under-employment in our country. In India, unemployment is the result of deficiency of capital. Moreover, larger number of labour force is engaged in the agricultural sector of the Indian economy than what is really justified in terms of GDP contribution of this sector. This has reduced the marginal product of agricultural labourer either to a negligible amount or to zero. This led to the existence of disguised unemployment in Indian agricultural sector.
. The Planning Commission has estimated that during 2004-05, the rate of unemployment has risen to 8.36 per cent from 7.32 per cent in 1999-2000.

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5. **Slow improvement in Rate of Capital Formation:** The basic characteristic of the Indian economy was theexistence of capital deficiency. However, in recent years, there is a slow and steady improvement in India's rate ofcapital formation. In a country like India where the rate of population growth is 1.6 percent during 2000-05, about 6.4 per cent investment is required to offset the additional burden imposed by increasing population. Thus, India requires as high as 14 per cent level of gross capital formation so that it may cover depreciation and maintain the same level of living.

6. Inequality in wealth distribution: Oxfam's report, 'An economy for the 99 percent', 2017, shows that the gap between rich and poor is far greater than had been feared. As per this report, **eight men own the same wealth as the 3.6 billion people** who make up the poorest half of humanity. Data on the distribution of global wealth – particularly in India and China – indicates that the poorest half of the world has less wealth than had been previously thought. In India, the richest **1 per cent of Indians have 58 per cent of total Indian wealth**. Fifty seven billionaires have the same amount of wealth as the bottom 70 per cent of India. The CEO of India's top informationfirm **earns 416 times the salary** of a typical employee in his company.

7. Poor Quality of Human Capital: Indian economy is suffering from the problem of poor quality of capital. If we enlarge the definition capital formation to include the use of any resource that enhances productive capacity, then besides physical capital the knowledge and training of the population will also form a part of capital. Hence, the expenditure on education, skill formation, research and improvements in health are included in human capital. Under United Nations Development Programme (UNDP), countries have been ranked on the basis ofHuman Development Index (HDI). This index is based on life expectancy, educational attainment and per capita income. It is an alternative indicator of socio-economic development of the country. As per the Human Development Report**, India ranks 130 out of 188 countries. India's HDI value for 2014 is 0.609**. In comparison to other nations in the **BRICS grouping**, India has the lowest rank with Russia at 50, Brazil at 75, China at 90, and South Africa at 116.

8.Low level of technology: Prevalence of Low level of technology is one of the important characteristics of developing country like India. Since new techniques are expensive and require a considerable degree of skill for their application in production, the twin requirements for the absorption of new technology are the availability of capital and training of an adequate number of skilled personnel. Hence, deficiency of physical and human capital, in terms of illiteracy and the absence of skilled labour force are the major hurdles in the spread of technology in the economy.

9. Lack of access to basic amenities: According to the Census of India 2011, **around 7 per cent of India's population (650 million) lives in rural and slum areas. Only 46.6 per cent of households in India have access to drinking water within their premises. A far lower, 43.5 per cent of households have access to tap water. Similarly, only 46.9 per cent households have toilet facilities within the household premises**. An evaluation study of the National Rural Health Mission (2011) conducted in seven selected states – UP, MP, Jharkhand, Odisha, Assam, J&K, and Tamil Nadu - assessed the levels of shortfalls faced by some of these states in health personnel. There was a **95 per cent shortage of skilled health personnel in Jharkhand**, around 80 per cent in MP and 70 per cent in UP . Assam reported only 11 per cent shortage, while **TamilNadu did not report any shortage at all.**

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10. Demographic characteristics: The demographic characteristics of India are not at all satisfactory rather these are associated with high density of population, a smaller proportion of the population in working age group of50-60 years and a comparatively larger proportion of population in the minor age group of 0-15 years. As per 2011census, the density of population in India **was 382 per sq. km**. as compared with **world density** of population of 41per sq km. Even in **China, the density is nearly 123 per sq km.** Again, as per 2011 census, 29.5 per cent of the total population is in the age group of 0-14 years, 62.5 per cent is in the working age group of 15-59 years and about 8.0per cent in the age group of 60 and above. All these show that dependency burden of our population is very high.

11. Under-utilization of natural resources: In respect of natural endowments India is considered as a very rich country. Various types of natural resources, such as land, water, minerals, forest and power resources are available in sufficient quantity in the various parts of the country. However, due to its very inherent problems like inaccessible regions, primitive techniques and shortage of capital such huge resources remained largely under-utilised. Until recently, India was not in a position to develop even **5 per cent of total hydro power potential of the country.**

12. Lack of infrastructure: Lack of infrastructural facilities is one of the serious problems from which the Indian economy is suffering till today. These infrastructural facilities include transportation and communication facilities, electricity generation and distribution, banking and credit facilities, health and educational institutes etc. The two most vital sectors i.e. agriculture and industry could not make much headway in the absence of proper infrastructural facilities in the country. Moreover, due to the absence of proper infrastructural facilities, development potential of different regions of the country largely remains under-utilised.

AGRICULTURE

At present, agriculture production India holds second position in the world. In 2007 around 16.6% of GDP is from agriculture and around 52% of manpower employed in this sector.

The following states are developed in agriculture:

Punjab

Uttar Pradesh

Madhya Pradesh

Haryana

Bihar

Andhra Pradesh

Maharashtra

West Bengal

Role of agriculture in India

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Agriculture is a very important sector of the Indian economy. It plays a major role in the overall development of the country as it contributes nearly 17% of GDP and engages around 52 per cent of the population of the country.

1) **Providing employment** –At the time of independence around 72 per cent of the population was engaged in agriculture and allied activities. As economy developed, its other sectors (industry and services) also developed and the percentage of people working in agriculture sector came down to around 52 per cent in 2008–09. However the increasing Labour force in quantity to agriculture would add only **low productivity and disguised unemployment**.

2) **Share in national income** – Its share in total GDP in 1950–51 was around 55 per cent come down to 17 per cent in 2008 – 09. This reduced share indicates that the economy and its non-agricultural sectors are growing.

3) **Supporting industries** – Agriculture has a big role in the development of industries specially the agro-based industries such as textiles, sugar, tea, paper. The prosperity of these agro-based industries is directly dependent upon the availability of inputs from the agricultural sector. There is a direct relationship between agriculture production and income and demand for Industrial goods.bec the demand for industrial products depends upon the income of the farmers which in turn depends upon agricultural production.

   Linkage between agriculture and Industry

   a. **Production Linkage:**
      Supply of agriculture productive input by farmers and supply of machinery, fertilizers to agriculture by industry.

   b. **Demand Linkage:**
      Impact of urban income and industrialization on demand for food and demand for agricultural raw material.

   c. **Saving and investment linkage:**
      Savings of individual and investment in industries.

4) **Shares in foreign trade** –At the time of independence and a number of years thereafter our **export** basket mainly consisted of ago-production-**cotton spices coffee fruits textiles, jute and tea**. These three accounted for more than 50 per cent of our export earnings. As economy developed, the share of agricultural exports in total exports fell down.

   As far as the agro-**imports** mainly cereals vegetable oil fats are imported and there is a big decline in the import of wheat rice and cotton.

5) **Supplier of food and fodder** –Agriculture meets almost the entire food-needs of the people. In India, people spend a very large proportion of their incomes on food and food products. Thus, the cost of living of people also gets affected by agricultural prosperity. If food is costly; the cost of living of the people also gets affected to a great deal.

   Agriculture also provides fodder to sustain livestock comprising of cattle, buffaloes and poultry etc.

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6) **Savings of capital and big source of capital formation –** Agriculture has low capital output ratio; in other words it requires lesser capital per unit of output produced compared with the industries. A capital poor economy like India can make efforts to develop this sector which along with increase in production could increase employment opportunity in the rural areas and could help in solving problems of urban congestion and pollution in the cities.

7) **Contributions to Government's revenue –** The government revenues also depend a great deal on agricultural prosperity. The direct contribution of agricultural taxes to the revenues of thee centre and the states is not significant but indirectly agriculture has a considerable influence on the revenues of the central and state governments.

8) **Solving problems of urban congestion and brain drain –** Migration from rural areas to urban areas and metropolitan cities has created a dual problem: on the one hand, it has deprived rural areas of skilled and educated persons and, on the other hand, it has created the problem of urban congestion. It agriculture is on the road to prosperity and is in a position to absorb fruitfully the growing talent in rural areas, the dual problem of urban congestion and rural brain drain will be solved.

Diversified agriculture – Indian agricultural has become diversified as will be clear from the following facts:

i. The share of non-crop sectors (fishery, forestry and animal husbandry) in total agricultural output is increasing.
ii. Area under commercial crop like sugar, cotton, oilseeds, etc. is increasing.
iii. Within food grains, area under superior cereals is increasing under the inferior cereals is declining.

1) **Modern agriculture –** Qualitative changes have taken place in agricultural sector especially in India since 1966 when Green Revolution was started.

i. The use of high-yielding varieties of seeds, chemical fertilizers, pesticides, threshing machine is rising.
ii. Farmers are increasingly resorting to intensive cultivation, multiple cropping, scientific water management in some states.
iii. There have been noticeable changes in the attributes of farmers. They are ready to accept new and scientific techniques of production.
iv. Agricultural capacity has improved a lot.
v. A number of institutions have come up for marketing agricultural products for providing agricultural credit, for purchasing and distributing of agricultural inputs and storage etc

2) **Improved agrarian system –** At the time of Independence, there were three types of land tenure systems prevailing in the country – **the zamindari system, the ryotwari system and mahalwari system.** Only the system of collecting rent or land revenue was different in these land tenure systems. Whatever the system of collecting land revenue, the tenant or the actual tiller of the land was exploited by the land owners. In order to stop the exploitation of the actual tillers of the soil and to pass on the ownership of land to them land reforms were introduced after Independence. Three measures were:

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3)

(i) Abolition of intermediaries
(ii) Tenancy reforms
(iii) Reorganization of agriculture

4) Other developments –

i. Farmers have been getting material inputs at subsidized rates.
ii. They are getting credit at low rates of interest.
iii. Government is helping them in producing their products at predetermined rates and marketing them.
iv. Minimum wage levels have been fixed for agricultural laborers.
v. Special programmes such as Integrated Rural Development Proramme, Jawahar Rozgar Yojana etc. have been started in rural areas to provide employment to the rural people.
vi. With the aim to have sufficiency in different food product like rice,wheat ,pulses National food security Mission is being implemented in identified district.
vii. The Rashtriya Krishi Vikas Yojna (RKVY) is being implemented for integrated development of food crops.
viii. Project like Forecasting Agriculture output using Space,Agro-metrological and land based observation(FASAL) and Extended Range forcasting system (ERFS) have been started to establish a more scientific and reliable basis for forecasting.

Measures to improve Productivity
1. Stable and Reasonable Price of farmers produces.
2. Adequate Marketing Facilities
3. Cheap Credit Facilities
4. Modern Inpute like seeds machinery ects at reasonable prices
5. Provide education, research and extention of agro economic services to give knowledge of modern method of farming
6. Large scale Irrigation, resettlement projects etc...

Industrial Policy

Any government action aimed at affecting industry may be considered to be part of industrial policy. A country must formulate industrial policy as an instrument of industrialisation. In a country like India, where private sector is allowed to co-exist in business, its control and regulation is necessary. Industrial policy is a necessary step in
this direction

Industrial Policy Resolution (IPR) of 1948:

In a mixed economy of our sort, the government should declare its industrial policy clearly indicating whatshould be the sphere of the State and of the private enterprise. A mixed economy means co-existence of the two sectors public and private. This the Government of India did by a policy resolution on 30 April 1948 called the first Industrial Policy Resolution of 1948, which made it clear that India was going to have a mixed economy.

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The Industrial Policy Resolution, 1948 divided the industrial structure into four groups:

1. Basic and strategic industries such as arms and ammunition, atomic energy, railways, etc., shall be the exclusive monopoly of the State.

2. The second group consisted of key industries like coal, iron and steel, ship-building, manufacture of telegraph, telephone, wireless apparatus, mineral oils, etc. In such cases the State took over the exclusive responsibility of all future development and the existing industries were allowed to function for ten years after which the State would review the situation and explore the necessity of nationalisation.

3. In the third group, 18 industries including automobiles, tractors, machine tools, etc., were allowed to be in the private sector subject to government regulation and supervision.

4. All other industries were left open to the private sector. However, the State might participate and/or intervene if circumstances so demanded.

Industrial Policy Statement of 1956:

On 30 April 1956, the Government revised its first Industrial Policy (i.e., the policy of 1948), and announced the Industrial Policy of 1956. The reasons for the revision were: (i) introduction of the Constitution of India, ii)adoption of a planning system, and (iii) declaration by the Parliament that India was going to have a socialistpattern of society.

All these principles were incorporated in the revised industrial policy as its most avowed objectives.The Resolution classified industries into three categories having regard to the role which the State would play ineach of them:

1. **Schedule A consisting of 17 industries** would be the exclusive responsibility of the State. Out of these 17 industries, four industries, namely arms and ammunition, atomic energy, railways and air transport would be **Central Government monopolies**; new units in the remaining industries would be developed by the State Governments.
2. **Schedule B, consisting of 12 industries**, would be open to both the private and public sectors; however, such industries would be progressively State-owned.
3. **Schedule C contained the remaining industries**. In their case the private sector was to have the main initiative of development. However, they were to fit within the economic and social priorities and policies of the government and were to be subject to the provisions of the Industries (Development and Regulation) Act, 1951.

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Industrial Policy Statement, 1977

The industrial policy was modified in December 1977 by a Statement in the Parliament. The main thrust of the new industrial policy was a shift in favour of small-scale sector, which was classified, into three sectors.

1. Cottage and household industries, which were a source of providing large scale self-employment.
2. Tiny sector which was defined on the basis of a small amount of investment below a specified limit.
3. Small-scale industries which were larger than the first two categories but were still having investment within specified limits.

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Industrial Policy of 1980

IPR 1980 re-emphasised the socio-economic goals of the earlier policy with certain clarifications and extensions,namely,

– optimum utilisation of installed capacity

– achieving higher productivity and more employment

– removal of regional disparities through preferential treatment for industrially backward districts

– enlarging the agricultural base of the economy be extending a preferential treatment to agro-related industries

– faster promotion of export oriented and import substitution industries.

The new Industrial Policy 1991 (NIP)

Faced with rising inflation and a balance of payments crisis is mid 1991, Indian Government introduced a comprehensive policy-reform package. In order to redress the situation the New Industrial Policy in 1991 was announced. The major objective of this policy are (i) build on the gains already made. (ii) to correct distortions that could have crept in to maintain international competitiveness, The Government announced a series of initiatives in respect of policies relating to the following areas'

I. Industrial

II. Public Sector

III. Foreign Investment and Foreign Technology Agreement

IV. MRTP Act.

Industrial Licensing Policy:- The important change€ relating to licensing in the NIP are:

(i) Industrial licensing has been abolished for all projects for a list of 18 industries (now reduced to 6) related to security and strategic concerns, Social reasons, hazardous chemicals and overriding environment reasons.

(ii) In locations other than cities of more than 1 million population, there will be no requirement of obtaining Industrial approvals from the Central Government, except for Industries subject to compulsory licensing.

(iii) Banks and financial institutions which gave loans to industrial units normally include a convertibility clause in their lending operations for new projects. This mandatory clause has aced as an unwarranted threat to private firms of takeover by financial institutions.

(iv) All existing schemes (the licenses registration, exempted registration) will be abolished.

(v) Entrepreneurs will henceforth only be required to file an information memorandum on new project and subsequent expansion

Public Sector: The number of industries reserved for the public sector in 1956 policy was 17. This number has now been reduced to 4 industries. Earlier many core industries like iron and steel, electricity, air transport, ship-building, heavy machinery industries were reserved for the public sector: The 1991 policy has removed the above industries from the reserved list of public sector.

- The Government will review the continuance of the existing public enterprises in low technology, small scale and non-strategic areas.

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- Public sector will be allowed to enter into areas not reserved for it. Similarly it may invite participation by the private sector in important areas of the economy.
- Chronically sick public units will henceforth be referred to the Board for Industrial and Financial
- Reconstruction (BIFR)
- Board of public sector companies will be made professional and given greater power:
- The NIP has made suitable policy changes to enable almost free flowof foreign investment and foreign technology. The following are the main provisions in this regard:
  (i) In high technology and high investment priority industries (34 Industries) where imported capital goods required automatic clearance
  Foreign equity holding upto 51 per cent by international trading companies is also now allowed. During 2000-03 100% FDI was allowed in drug and pharmaceuticals, hotel and tourism, courier
  (ii) services, oil refining, mass rapid transport system,airport,E-commerce,76 % FDI is allowed in private banking,26% FDI defence production insurance ,and print media.
  (iii) The new policy also provides for automatic approval to foreign technology agreements in the case of priority industries within certain guidelines.
  (iv) No permission will be required for hiring foreign technicians and testing indigenously developed technology abroad.

MRTP Act Under the Act, all firms with assets worth above a certain limit (₹1 00 crore) were called MRTP firms. These firms were allowed to enter into selected fields only and that to on a case-by case I approval basis. Apart from getting licenses, these were also required to get separate approval for any investment proposals. The NIP therefore removed the threshold limit of assets in respect of MRTP and dominant undertakings. These firms are now no longer required to seek prior approval of the Government for investment in the delicensed industries and now are at par with other firms. The amended. Act gives more emphasis to the prevention and control of monopolistic, restrictive and unfair trade practices so as to protect the interests of consumers.

Disinvestment

As stated above, privatization can be carried out in many ways and in India it has been mainly done by disinvestment. Disinvestment means selling of an investment. In the context of privatization, it means selling of Government share in public sector units in the market.

Conditions leading to disinvestment: As stated earlier. Indian economy was passing through severe resources crunch during the period 1981-91 it was on the average of bankruptcy. In order to revive the economy many efforts were undertaken One of the them was (the announcement of the New Economic Policy Committee in 1982 Both Committees suggested disinvestment of public sector units. Hence, disinvestment was incorporated as one of the elements of the NEP 1991.

Objectives: The following are the main objectives behind disinvestment:

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- To raise resources from within the public sector for meeting (i) the cost related with the closure of sick units (i) restructuring those units which are sick but can be revived and (iii) retraining the displaced or affected, workers
- To improve performance of the Public Sector Units in order to make them globally competitive,
- To modernize public sector units through strengthening R & D;
- To retire public debt;
- To fund the genuine needs of expansion;
- To widen the capital market base;
- To mitigate fiscal deficits.

Methods of Disinvestment : Disinvestment has been carried out in many ways. Important ones are:

- Equity shares of Public Sector Units were offered to the retail investors through domestic public Issues.
- Government selling part of its share in one public sector unit to another is also one of the ways of disinvestment.
- Another way of disinvestment in selling Government's take in selected public sector units to its I down financial.
- Still another method of disinvestment which has been used by the Government is keeping 26 percent take in public sector unit and but holding major say in the decision-making.
- Currently, the method of strategic sale is being used by the Government. Accordingly, the Government sells a major portion of its stake to a strategic buyer and hands over the management control

Indian economy is opening up to the world in a big way from the beginning of early 1990's. A long side of the liberalization of external sector, large many international transactions of the economy and economic integration of the Indian economy have been set on the course towards globalization. India's participation in the world trade has increased after the completion of Uruguay Round of trade negotiations in April, 1994 and the setting up of WTO (World Trade Organization) in January, 1995. It is important to understand, analysis and assess the Indian economy in the new world setting.

Recent Trends in Indian Economy

Goods and Services Tax (GST)

On 3rd August, 2016 entire India was glued to Rajya Sabha when the Rajya Sabha successfully passed the Constitutional Amendment Bill for GST (GST Bill) which eventually paved the way for GST in India.GST is abbreviation for Goods and Service Tax. GST is also known as Value Added Tax (VAT) in few countries.GST / VAT is a consumption based tax wherein the basic principle is to tax the value addition at each businessstage.

Internationally, GST was first introduced in France and now more than 150 countries have introduced GST. Most of the countries, depending on their own socio-economic formation, have introduced National level GST or Dual GST.

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GST is different from the current tax structure in many ways. Currently, taxes treat goods and services differently. However, 'goods' attract Excise at manufacturing level and VAT at the time of sale. In contrast, services attract only one levy i.e. Services tax on provision of taxable services.

.

Demonetization

Demonetization is the act of stripping a currency unit of its status as legal tender. The old unit of currency must be retired and replaced with a new currency unit.

On 8 November 2016, Prime Minister Narendra Modi announced the "demonetisation" of Rs. 500 and Rs. 1,000 notes with effect from the next day. Through the days after 8 November, the government has made a set of claims with regard to the objectives and outcomes of the demonetisation scheme.

- The first claim is that demonetisation would plug terror financing.
- The second claim is that demonetisation would help unearth "black money."
- The third claim is that the unearthed black money would expand the fiscal space of

the government. When unaccounted cash is not returned to the banking system, the Reserve Bank of India(RBI) can use the savings to pay the government a dividend.

- The fourth claim is that demonetisation would help reduce interest rates in the banking system.
- The fifth claim is that demonetisation would help formalize India's

informal economy, reduce the extent of transactions in cash and help create a "less-cash economy."

A number of incentives have been offered to induce people to use digital transactions.

Demonetization as a cleaning exercise may produce several good things in the economy. The immeasurable benefits of having more transparency and reduced volume of black money activities can be expected as long term benefits.

Comparison of India and the World

China and India, which account for **nearly 37 per cent of the world population** show a population growth of about 2 per cent per annum during 1980-90. It may, however, be noted that in China, population growth rates declined to 0.5 per cent during 2000-09, whereas in India, it is still high **at 1.38 per cent**. Indeed, India ranked first in termsof annual population increase for the period 2010-15

Sex Composition of Population

we find that aggregate sex ratio has declined in the world from 986 in 2001 to **982 in 2015.** Indeed, almost all the countries trend has been similar, except Brazil. In Brazil, during the same period, the sex ratio has increased from 1,025 to 1,034. In India, a disturbing revelation of 1991 census is the decline in the ratio of females per 1,000 males. The sex ratio declined from 934 in 1981 to 929 in 1991. In 2011, there is a slight improvement in the proportion of females to 940. However, it declined in 2015 to 929 females per 1,000 males, while in USA it stood at 1,017.

Human Development: International Comparisons

Under United Nations Development Programme (UNDP), countries have been ranked on the basis of Human Development Index (HDI). This index is based on life expectancy, educational attainment and per capita income. It is an alternative indicator of socio-economic development

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of a country. As per the Human Development Report (HDR) 2015, India ranks **130 out of 188** countries. India's HDI of 0.609 is below the average countries in the medium human development group (0.630) but marginally higher than the HDI average of South Asian countries (0.607). **As compared to other BRICS nations, India reports the least mean years of schooling, and LEB that is lower than that of Brazil, China and Russia, but higher than that of South Africa. Bangladesh, with a lower GNI per capita than India, has a much higher LEB.** The indices of education as reflected by the HDI show that the progress made in the education sector needs to be faster, with a focus on greater coverage.

Research and development

In India, the R&D sector grew by 20.8 per cent in 2012-13 and contributed 1.4 per cent of GDP (Central Statistical Organisation's old method).

.However, according to the Global Competitiveness Report 2015-16, India's capacity for innovation has been lower than that of many countries like the USA, the UK, South Korea, and even South Africa. Even in quality of scientific research institutions, India scores lower than China and South Africa. This is also exhibited through its poor score on university–industry collaboration in R&D as compared to some **other BRICS (Brazil, Russia,India, China and South Africa) nations like China and South Africa. I**n terms of patents granted per million population, India fares badly compared to other BRICS countries. In terms of company spending on R&D also, India ranks below China. **Only in terms of availability of scientists and engineers, does India score better or is equal to other BRICS countries.**

Global Links

The world economy is bound together by trade in goods and services, financial flows, and movements of people. As national economies develop, their links expand and grow more complex. The indicators in *Global links*measure the size and direction of these flows and document the effects of policy interventions, such as tariffs, trade facilitation, and aid flows, on the development of the world economy.

Equity flows

Equity flows comprise foreign direct investment (FDI) and portfolio equity. It has long been recognized that FDI flows can carry the benefits of knowledge and technology transfer to domestic firms and the labor force, productivity spillover, enhanced competition, and improved access for exports abroad. Moreover, they are the preferred source of capital for financing a current account deficit because FDI is non-debt creating. Investors continue to be attracted by improved business regulatory environment, growth prospects, and buoyant and expanding domestic markets. World **Development Indicators (2015) noted that although many economies receive FDI, flows remain highly concentrated: Brazil, China and India account for more than half. In 2014, India's foreigndirect investment inflow was $ 33,871 millions**. In the same year, China's and USA's FDI inflow was around 9 times and 4 times that of India respectively.

Global portfolio equity

.**GDP Shares in selected countries:**.

USA, which is a developed country, shows that the share of agriculture in GDP is just 1 per cent in both the years i.e. 2000 and 2015. Further, during the same years, the share of services to GDP was 76 and 78 per cent respectively. **If we closely look at the trend, it could be observed that in case of all the developed countries GDPis highly contributed by services, followed by industry and manufacturing and least contributing sector is agriculture.**

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In China, for the year 2015, the share of services sector in GDP was 50 per cent. Further, for the same year the share of industry, manufacturing and agriculture in GDP was 41, 30 and 9 per cent respectively. **India was unique that it skipped the industrial phase and shifted directly to services and that this transition is an economicachievement.** This could be observed from the trend that, in India, between 2000 and 2015, the share of servicessector in GDP has increased from **51 to 53 per cent**. For the same period, agriculture contribution has decreased from **23 to 17 per** cent. Though industry's contribution has increased **from 26 to 30 p**ercent, manufacturing sector's contribution to GDP was almost stagnant (around 16 per cent).

DEMOGRAPHIC TRENDS IN INDIA

Size of Population: The Indian's population in growing since 1901 and India's present population is 135 crores

Year	*Population (in crores)*
1901	23.84
1911	25.21
1921	25.13
1931	27.90
1941	31.87
1951	36.11
1961	43.92
1971	54.81
1981	68.33
1991	84.33
2001	102.70

- India's population rank is second in the world after China.
- India has only about 2.4% of the world's area and 1.2% of the world's income but India accommodates about ***16.7% (nearly 17%) of the world's population.***
- ***Every sixth*** *person in the world is an Indian. (Nearly seventh)*
- *The annual addition to India's population is almost equal to the total population of* ***Australia.***

Rate of Growth:

Following table shows the rate of growth of population in India. It shows growth rate of population per decade and per annum.

Since 1921, population has started increasing. In fact, year 1921 is known as year of Great Divide' for India's population.

- From the decade 1971 – 81 to till date, the growth rate has come down to 1.93% in 1991 – 2001.

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Census Year	Population	Change (%)
1951	361,088,000	–
1961	439,235,000	21.6
1971	548,160,000	24.8
1981	683,329,000	24.7
1991	846,387,888	23.9
2001	1,028,737,436	21.5
2011	1,210,726,932	17.7

Birth rate and Death rate:

Birth rate refers to number of birth per thousand of population, Similarly; death rate refers to number of death per thousand of population

Year	Birth Rate	Death rate:
1951	39.9	27.4
1961	41.7	22.8
1971	36.9	14.9
1981	33.9	12.5
1991	29.5	9.8
2001	25.4	8.4
2005	23.8	7.6

Crude Birth and Death rate:

Over the years, birth rate in India fallen and death rate also fallen. Among all the states, Kerala has the lowest birth rate of 14.7 %(2007) and U.P. has the Highest birth rate 29.5% (2007). Considering death rate –the lowest is in West Bengal 6.3% and Highest in Orissa 9.2% in 2007.

Density of population:

Density of population refers to the persons per square kilometer. It has increased since 1951. In India at present average It is 324 persons per square kilometer.

Year	Density of population
1951	117
1961	142
1971	178
1981	216
1991	274
2001	324

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Density of population is not same for all the states. Kerala, West Bengal (904 persons), Bihar (880 persons) and U.P. have density higher than the average density, Andhra Pradesh, Himachal Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Orissa, Rajasthan, Sikkim etc have lower density than the average density. Delhi has density of more than 9224.

Sex ratio:

Sex ratio refers to the number of females per 1000 males. The following table gives sex – ratio since Independence.

Sex Ratio (females per – 1000 males)

Census Year:	Sex ratio
1951	946
1961	941
1971	930
1981	934
1991	927
2001	933

- Sex ratio is the most favorable to woman in the state of Kerala only, it is 1058 in 2001.
- Kerala is the State which provides better Status better to women as compared to other States.
- A number of reasons are ascribed for a high ratio of males to females. These are:

  (a) Neglect of female child (b) High death rate among females (c) Under reporting of female births.

Life expectancy at birth

Life expectancy refers to the mean expectation of life at birth at Birth. The following Table shows life expectancy of life at birth. The following Table shows life expectancy at birth both for males and females.

	Life expectancy at Birth (in years)		
Period	**Male**	**Female**	**Over all average**
1951	32.5	31.7	32.1
1961	41.9	40.6	41.3
1971	46.4	44.7	45.6
1981	54.1	54.7	54.4
1991	59.0	59.7	59.3
2001	62.3	65.3	63.8

Life expectancy has improved over the years. Amongst the states kerala has the highest life expectancy 74 and M.P. has lowest i.e. 58 in 2006.

Theory of Demographic Transaction

Says that every country passes through 3 stages.

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In the first stage, both birth rate and death rate are very high.

In the second stage, birth rate comes down slightly but death rate comes down very heavily; this stage is also called the stage of population explosion as population increases at a very high rate during this stage. India is passing through the second stage of demographic transition.

In the third stage, in the theory of demographic transition in the last stage, birth rate fails and death rate also falls the net result is population grows at a very modest rate.

How growth of population has affected economic growth in India.

1. **Growth of National Income:** National Income rose by more than 12 times but on account of increase in population by 2 times, the per capita income rose by 3.25 times during the planning period. The average annual growth was 4.4% but the per capita income was only 2.3%.
2. **Food Supply:** The total production of food grains increased from 51 million tones in 1951 to 231 million tones in 2007-08, but population has increased from 361 million to 1138 million. Consequently, per capita food grains increased from 395 grams to 443 grams.
3. **Unproductive consumers:** In India, 63% of the population (working) is in the age group 15-64 and 37% of the population is under 15 or above 64 years. Increase in the population of children and old persons, which leads to higher burden of unproductive consumers on total production.
4. **Problem of Unemployment:** The increase in backlog of unemployment in each successive plan shows how growth in population has led to increase in unemployed persons. Backlog of unemployment was estimated to be 34 million in FYP-9.
5. **Capital Formation:** Growth is a function of capital accumulation. In a country like India where the rate of population growth continues to be high, much development would not materialize. This is because a fast growth in a population of a country reduces its capacity to save and invest which in turn affect its productive capacity and incomes.
6. **Ecological degradation:** A rapid growing population in India has somewhat upset the ecological balance. There is a gradual shrinkage of are a covered by forests, removal of forests, high concentration of population and inadequate infrastructural facilities is the cause of serious ecological degradation.

GOVERNMENT MEASURES FOR SOLVING THE POPULATION PROBLEM

In a developing country like India. Population growth is not controlled properly. A full-fledged department of family planning was created in 1966. Various contraceptive methods were offered and the acceptors had the freedom to choose any of the methods offered. This has been known as cafeteria approach', Under the fifth plan, A new national Population Policy replaced earlier Population Policy of the government Under the policy the marriageable age was raised to 18 years and 21 years for girls and boys respective monetary incentives were offered for voluntary sterilization and family planning was made a mass movement by involving various community groups like Zila Parishad, Panchayat Sarnitis, Co-operative Societies, and trade unions at the grass roots levels.

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National Population Policy, 2000 (NPP-2000)

The following arc the main features of the NPP:

1. Address the unmet needs for baste reproductive and child health services, supplies and infrastructure.
2. Make school education free and compulsory up to the age of 14.
3. Reduced infant mortality rate (IMR) to below 30 per 1000 live births.
4. Reduce maternal mortality r a t e (MMR) to below 1 per 1000 live births.
5. Promote delayed marriage for girls, not earlier than age 18.
6. Achieve 80% institutional deliveries and 100 per cent deliveries by trained persons.
7. Achieve 100 per cent registration of marriage, pregnancy, births and deaths.
8. Integrate Indian System of Medicine (ISM) in the provision of reproductive and child health services, and in reaching out to households.
9. Promote vigorously the small family norms to achieve replacement levels of TFR.
10. Bring about convergence in implementation of related social sector programs so that family welfare becomes a people centered program.

POVERTY

ABSOLUTE POVERTY AND RELATIVE POVERTY:

Absolute poverty: - When poverty is taken in absolute terms, it 'is absolute poverty. The concept of absolute poverty is relevant for the less-developed countries. In India we use the concept of absolute poverty for measuring poverty.

Relative poverty: - When poverty is taken in relative terms and is related 10 the distribution of income or consumption expenditure, it is relative poverty. The concept of relative poverty is more relevant for the development countries. Gini co-efficient are often used for measuring poverty in relative sense.

POVERTY IN INDIA:

Poverty Line : As per planning Commission of India, a person is below the poverty line in his daily consumption of calories is less than 2400 in rural areas and 2100 in urban areas. As per the new definition one who earns less than ₹ 368 per month in rural area and ₹559 per month in urban area will be below the poverty line. The latest National Sample Survey Organization (NSSO) 2004-05 shows that the percentage of people living below poverty line hasreduced to 22% in 2004-05 the tenth plan target in 19.3% by 2007 and 11% by 2012.

CAUSES OF POVERTY:

Various causes of poverty can be classified under economic, political and social heads.

1. **Economic Causes: -** Majority of population depends upon Agriculture and The income of agricultural workers is substantially below average due to small size of land inadequate irrigation facilities. Lack of enough financial resources needed for ensuring development and raising productivity.

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2. **Political and Social Causes:** Political vested interests are also responsible for widespread poverty in the economy.
3. **Other Causes:** Other factor such as family size and family composition, high growth of population and high rate of unemployment, poor levels of education and skills, lack of motivation and will to get out of poverty.

GOVERNMENT PROGRAMMES FOR POVERTY ALLEVIATION

Programme	Year	objective
1. Integrated rural development programme (IRDP)	**1976-1977**	Help families to cross poverty line through a strategy of productive asset endowment
2. National rural employment programme(NREP)	**October 1980**	Generating gainful employment in rural areas
3. Rural landless employment guarantee programme(RLEGP)	**15th august 1983**	Improve and expand employment oppurtunities
4. Jawahar rozgar yojna	**1989-90**	Generating employment
5. Training of rural youth for self employment(TRYSEM)	**15th august 1979**	Generating employment oppurtunities for unemployed educated rural youth
6. Development of women and children	**1980-1985**	Creating employment genearating activities for rural women
7. Drought prone area programme	**1970-71**	Organize permanent work and generate employment through labour intensive techniques
8. Desert development programme	**1977**	Controlling diversification of desert areas
9. Minimum needs programme	**1975-80**	Aims at 100% employment in the age group of 16-24
10. Employment exchange	**1980**	They provide information on possible vocational avenues
11. Employment guarantee scheme	**1980-85**	It aims at providing employment opportunities by giving economic assistance to unemployed persons. It was launched in states of Maharastra, West Bengal, Kerala, Rajasthan

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12. Development of animal husbandry and agriculture	**1992-93**	Generating employment opportunities
13. Employment assurance scheme	**1994**	Provide 100 days of manual work to rural unemployed
14. Prime Minister Rozgar Yojna	**1993**	Providing employment by setting up enterprises
15. Prime ministers integrated urban poverty eradication programme	**1995-96**	Providing employment to urban youth
16. Swarn Jayanti gram swarozgar yojna	**April 1999**	IRDP+TRYSEM+DWCRA+millions well scheme
17. Swarna Jayanti rozgar yojna.	**1st December 1997**	Provides assistance to urban unemployed
18. Jawahar gram samridhi yojna	**April 1999**	Jawahar rozgar yojna restructured as Jawahar gram samridhi yojna, provides gainful employment
19. Pradhan Mantri Gram Sadak Yojana (PMGSY):	**December, 2000**	Its aim is to provide road connectivity through good, all weather roads to 1.60 lakh unconnected village, with a population of 500 persons or more by the end of the Tenth Plan.Up to March 2009 a total length of 214281 km. of road works had been completed.
20. Indira Awas Yojana (IAY)	**2004**	This is a major scheme for construction of houses to be given to the poor, free of cost.Up to Dec. 2006, about 153 lakh houses had been constructed/ upgraded. And during 2007-08 9.4 lakh houses constructed, during 2008-09 21 lakh houses constructed.

Schemes Launched by Narendra Modi Government

1. **Pradhan Mantri Jan Dhan Yojana (PMJDY)**
   Launched:28August2014
   Main Objective: Financial inclusion and access to financial services for all households in the country.

2. **Pradhan Mantri Sukanya Samriddhi Yojana (PMSSY)**
   Launched:22January2015
   Main Objective: Secure the future of girl child

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3. **Pradhan Mantri MUDRA Yojana (PMMY)**
Launched:8April2015
Main Objective: Financial support for growth of micro enterprises sector.

4. **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)**
Launched:9May2015
Main Objective: Provide life insurance cover to all Indian citizens

5. **Pradhan Mantri Suraksha Bima Yojana (PMSBY)**
Launched: **9 May 2015**
MainObjective:Provide accidental insurance cover to all Indian citizens

6. **Atal Pension Yojana (APY)**
Launched:9May2015
Main Objective: Increase the number of people covered under any kind of pension scheme.

7. **Pradhan Mantri Awas Yojana (PMAY)**
Launched:25June2015
Main Objective: Achieve housing for all by the year 2022, 2 crore in Urban and 3 Crore homes in Rural areas

8. **Sansad Adarsh Gram Yojana (SAGY)**
Launched:11October2014
Main Objective: Social, cultural, economic, infrastructure developments in the villages, i.e. development of model villages called "Adarsh Gram"

9. **Pradhan Mantri Fasal Bima Yojana (PMFBY)**
Launched:11October2014
Main Objective: Provide insurance cover to rabi and kharif crops and financial support to farmers in case of damage of crops.

10. **Pradhan Mantri Gram Sinchai Yojana (PMGSY)**
Launched:01July2015
Main Objective: Irrigating the field of every farmer and improving water use efficiency toprovide ₹Per Drop More Crop'.

11. **Pradhan Mantri Garib Kalyan Yojanay (PMGKY)**
Launched: April2015
Main Objective: Implement the pro-poor welfare schemes in more effective way and reaches out to more poor population across the country.

12. **Pradhan Mantri Jan Aushadhi Yojana (PMJAY)**
Launched: March2016
Main Objective: Provides drugs/medicines at affordable cost across the country.

13. **Make in India**
Launched:25September2014
Main Objective: To encourage multi-national, as well as domestic companies to manufacture their products in India and create jobs and skill enhancement in 25 sectors.

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14. **Swachh Bharat Abhiyan**
Launched:2October2014
Main Objective: To fulfil Mahatma Gandhi's dream of a clean and hygienic India.

15. **Kisan Vikas Patra**
Launched:3March2015
Main Objective: To provide safe and secure investment avenues to the small investors

16. **Soil Health Card Scheme**
Launched:17February2015
Main Objective: To help farmers to improve productivity from their farms by letting them know about nutrient/fertilizer requirements for their farms.

17. **Digital India**
Launched:1July2015
Main Objective: To deliver Government services to citizens electronically by improving online infrastructure and by increasing Internet connectivity.

18. **Skill India**
Launched:16July2015
Main Objective: Train over 40 crore people in India in different skills by 2022.

19. **Beti Bachao, Beti Padhao Yojana**
Launched:22January2015
Main Objective: To generate awareness and improving the efficiency of welfare services meant for women.

20. **Mission Indradhanush**
Launched:25December2014
Main Objective: To immunize all children as well as pregnant women against seven vaccine preventable diseases namely diphtheria, whooping cough (Pertussis), tetanus, polio, tuberculosis, measles and hepatitis B by 2020.

21. **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**
Launched:24June2015
Main Objective: Providing basic services (e.g. water supply, sewerage, urban transport) to households and build amenities in cities which will improve the quality of life for all, especially the poor and the disadvantaged.

22. **Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)**
Launched:25July2015
Main Objective: Electric supply feeder separation (rural households & agricultural) and strengthening of sub-transmission & distribution infrastructure including metering at all levels in rural areas.

23. **Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDUGKY)**
Launched:25July2015
Main Objective: To achieve inclusive growth, by developing skills and productive capacity ofthe rural youth from poor families.

24. **Pandit Deendayal Upadhyay Shramev Jayate Yojana (PDUSJY)**
Launched:16October2014

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Main Objective: To consolidate information of Labour Inspection and its enforcement through a unified web portal, which will lead to transparency and accountability in inspections.

25. **Swadesh Darshan Yojana**
Launched:09March2015
Main Objective: Develop world class tourism infrastructure.

26. **PRASAD (Pilgrimage Rejuvenation and Spiritual Augmentation Drive)**
Launched:09March2015
Main Objective: Develop world class tourism infrastructure in Amritsar, Ajmer, Amaravati, Dwaraka, Gaya, Kanchipuram, Kedarnath, Kamakhya, Mathura, Puri, Varanasi and Vellankani.

27. **National Heritage City Development and Augmentation Yojana (HRIDAY)**
Launched:21January2015
Main Objective: Bringing together urban planning, economic growth and heritage conservation in an inclusive manner to preserve the heritage character of each Heritage City.

28. **Udaan Scheme**
Launched:14November2014
Main Objective: Encouraging girls for higher technical education and aims to provide a platform that empowers girl students and provides them with better learning opportunities.

29. **National Bal Swachhta Mission**
Launched:14November2014
Main Objective: To provide hygienic and clean environment, food, drinking water, toilets, schools and other surroundings to the children.

30. **Smart City Mission**
Launched:25June2015
Main Objective: To develop 100 cities all over the country making them citizen friendly and sustainable

31. **Gold Monetisation Schemes**
Launched:04November2015
Main Objective: To reduce the reliance on gold imports over time.

32. **Startup India, Standup India**
Launched:16January2016
Main Objective: To provide support to all start-up businesses in all aspects of doing business in India.

33. **DigiLocker**
Launched: 01 July 2015
Main Objective: To provide a secure dedicated personal electronic space for storing the documents of resident Indian integrated Power Development Scheme (IPDS)

34. **Shyama Prasad Mukherji Rurban Mission**
Launched:21February2016

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Main Objective: To create 300 rural clusters across the country and strengthen financial, job, and lifestyle facilities in rural areas.

35. **Sagarmala Project**
Launched:31July2015
Main Objective: To transform the existing ports into modern world class ports.

36. **'Prakash Path' – 'Way to Light' – The National LED Programme**
Launched:05January2015
Main Objective: To distribute LED bulbs and decrease the power consumption.

37. **UJWAL Discom Assurance Yojana (UDAY)**
Launched:20November2015
Main Objective: To obtain operational and financial turnaround of State owned Power Distribution Companies (DISCOMs).

38. **Vikalp Scheme**
Launched:01November2015
Main Objective: For confirmed accommodation in next alternative train for the waitlisted passengers.

39. **National Sports Talent Search Scheme (NSTSS)**
Launched:20February2015
Main Objective: To Identify sporting talent among students in the age group of 8–12 years.

40. **Rashtriya Gokul Mission**
Launched:16December2014
Main Objective: To conserve and develop indigenous bovine breeds.

41. **PAHAL-Direct Benefits Transfer for LPG (DBTL) Consumers Scheme**
Launched:01January2015
Main Objective: To send the subsidy money of LPG cylinders directly into the bank accountsof the consumers and increase efficiency & transparency in the whole system.

42. **The National Institution for Transforming India (NITI AAYOG)**
Launched:01January2015
Main Objective: to foster involvement and participation in the economic policy-making process by the State Governments of India.

43. **Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)**
Launched:17September2015
Main Objective: To Safeguard Health, Environment and Economic Conditions of the Tribals

44. **Namami Gange Project**
Launched10July2014
Main Objective: To integrates the efforts to clean and protect the Ganga river in a comprehensive manner

45. **Setu Bharatam Project**
Launched:03March2016
Main Objective: To free all national highways from railway level crossings and renovate the old bridges on national highways by 2019.

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46. Pradhan Mantri Ujjwala Yojana

Launched:1May2016

Main Objective: To distribute free LPG connections to the women belonging to 5 Crore BPL families across the country.

UNEMPLOYMENT

Every sixth person in the world is an Indian and every third poor person in the world is also an Indian. It has been observed that with the increase in the number of unemployed persons poverty expands. Removal of unemployment has been gi.ven serious consideration only after **Fifth Plan.**

MEANING AND TYPES OF UNEMPLOYMENT

A person who is not gainfully employed in any productive activity is called unemployed. The important forms of unemployment are:

1. **Voluntary unemployment:** When a person is unemployed because he is not willing to work at the existing wage rate is called voluntary unemployment. And there are some people who get a continuous flow of income from {heir property or other sources.
2. **Frictional Unemployment:** Frictional unemployment may arise when some workers arc temporarily out of work while changing jobs. II may also result when the work is suspended due to strikes or lockouts.
3. **Casual unemployment:** Where workers an: employed on a day-to-day basis or on short term contracts, there are changes of casual unemployment.
4. **Seasonal unemployment:** There are some industries and occupations agriculture in which production activities are seasonal in nature. People engaged in such type of work or activities may remain unemployed during the off – season.
5. **Structural Unemployment:** Due to structural changes I the economy, structural unemployment may result. It is caused by a decline in demand for production in a particular industry. Most of the underdevelopment in India is structural unemployment.
6. **Technological unemployment:** Some workers tend to be replaced by machines due to the introduction of new machinery, improvement in methods of production, labour-saving devices, etc.
7. **Cyclic unemployment:** Trade cycles- especially recessionary and depressionary phases cause cyclical unemployment in developed countries.
8. **Chronic unemployment:** When unemployment tends to be a long – term feature of a country it is called chronic unemployment. Underdeveloped countries suffer from chronic unemployment. Note: Above all type of unemployment represents open unemployment.
9. **Disguised unemployment:** A situation of unemployment in which a person is apparently employed but his contribution to the production is almost nil is called disguised unemployment. In disguised unemployment marginal productivity of workers is zero. It is a common phenomenon in agriculture sector

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Nature of unemployment in India

- Most of the unemployment in India is definitely structural urban unemployment is mainly of industrial unemployment and educated unemployment type. Rural unemployment is seasonal and disguised in nature. It is estimated that over one third of India's work force is disguisedly unemployed.

Measurement of unemployment

There are three main measure of employment and unemployment..

1. **Usual persons Status (UPS)**: Usual person status (UPS) measure estimates the number of person who be said to be **chronically** unemployed.
2. **Current Weekly Status (CWS)**: The reference period here is u week. According to this estimate a person is said to be employed for the week even if he is employed only for a day during that week.
3. **Current Daily Status (CDS)**: The reference period here is a day It counts every half day's activity status of the respondent over the week

Unemployment in selected countries

Countries	2009
India	7.2
Australia	5.8
Bangladesh	2.5
China	9.0
Indonesia	8.2
Japan	5.2
Malaysia	3.5
Pakistan	5.2
Sri Lanka	5.2

INFRASTRUCTURE

Energy

Energy is an important input for most of the production processes and consumption activities. It plays a crucial role in the economic development. Economic growth and demand for energy are positive co-related. A study shows a 3 per cent rise in industrial production in the world's accompanied by a 2 per cent increase in energy consumption. A similar relation is also observed in India.

India is both major energy producer and consumer. India currently ranks as the world's 7th largest energy producer, accounting for about 2.49 % of the world's total energy production. It is also the world's 5th largest energy consumer accounting for about 3.45% of the world's total

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energy consumption. However,it is noteworthy that India's per capita consumption is one of the lowest in the world,

The population living mostly in rural areas depends upon non-commercial traditional sources of energy such as firewood, dung cakes and agricultural wastes. At present, nearly 27 per cent of the energy consumed is obtained from non-commercial sources or traditional sources. The rest is commercial energy and is obtained from oil and gas, coal, hydro-electricity and nuclear power. Productin of nuclear power has started, but is not much.

There is a distinction between *primary energy resources* and *final energy resources*. When coal is consumed for generating electricity and electricity is consumed by industry. We call coal as primary energy resource and electricity as the final one. Coal, petroleum products and natural gas are both primary resources and final resources as they are consumed directly as well as indirectly, while electricity is, by and large, the only final energy resource.

Major users of the commercial energy are industry (38 per cent), Domestic (24 per cent), agriculture (22 per cent) and commercial establishment (9 per cent).

Transportation

Railways – Indian Railways, Asia's largest and world's third largest rail network under a single management, has been contributing to the industrial and economic landscape for over 150 years. There are two main segments of railways – freight and passenger. The freight segment accounts for roughly 70% of revenues and passengers 30% of revenues. The total route length of railways was 63.5 thousand kilometers in 2008–09. Out of which 17.9 thousand kilometers were electrified. During 2008–09 it carried 6900 million of passengers and 832 million tonnes of freight traffic.

Problems of transport

1. The existing technology of both electric and diesel locomotive is very old.
2. The railway network is smaller and inadequate vis-à-vis the requirements of the economy.
3. The railways is facing the problem of financial crunch.
4. Because of social responsibilities, railways is forced to operate a number of unremunerative lines and suffer heavy losses. Often, essential goods like foodgrains, fruits and vegetables have to be carried at a loss.
5. Railways also suffers from over crowding and poor passenger services.

Road transport

– The Indian road network is one of the largest in the world. At the beginning of the first plan, India had 1,57,000 kms of surfaced roads and about 2,43,000 kms of unsurfaced road. In 2002–03, the total road length had increased to 24,83,300 kms. Out of which 14,20,500 kms is surfaced. The National Highways now encompass a road length of 66590 kms, and carry more than 40 per cent of the total road traffic. The rural roads network connects around 65 per cent all weather roads.Road occupies crucial position in the transportation matrix of India as they carry nearly 61% of freight and 87% of passenger traffic.

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Problems of road transport

- The road length is inadequate
- Interior areas and hilly tracts remain to be linked with roads.
- Large tracts of rural roads are mud roads, which cannot be used for playing heavy traffic.
- A number of urban roads are also poorly maintained.
- Golden quadrilateral connects Mumbai , Delhi , Chennai , Kolkata

Water transport

Water transport can be divided into inland water transport and shipping, coastal shipping and overseas shipping.

India has a long coastline of 7,517 kms, 12 major ports and 200 minor ports and a vast hinterland. Coastal shipping is very energy efficient and cheapest mode of transport for carrying bulk goods (like iron and steel, iron-ore, coal, timber etc.) over long distances. However, there had been a sharp decline in coastal shipping operations during 1960s and 1970s. The Gross Registered Tonnage (GRT) fell from 0.31 million in 1961 to 0.25 million in 1980. However, there was an improvement in the coastal shipping in 2001 as coastal tonnage rose to 0.70 million GRT. The main factors for poor growth of coastal shipping have been (1) high transportation costs, (2) port delays, (3) over-aged vessels, (4) lack of mechanical handling facilities, (5) imbalance in coastal traffic movement and, (6) slow handling of the cargo at ports. These inflict heavy losses on shipping companies.

India's overseas shipping has improved over the planning period. The country has the largest merchant and shipping fleet among developing countries and ranks 20th in the world in shipping tonnages. As compared to 1.92 million GRT at the time of independence shipping tonnage was 8.6 million GRT at the end of March, 2007. The fleet at the end of March, 2007 was 787 vessels.(1.91 % of the world fleet.)

The 12 major ports carry about three-fourth of the total traffic, with Vishkhapatnam as the top traffic handler in each of the last six years.

Problems faced by Indian ports

- Operational constraints such as frequent breakdown of cargo handling equipment due to obsolescence.
- Inadequate dredging and container handling facilities.
- Inefficient and non-optimal deployment.
- Lack of proper coordination in the entire chain.
- Indian containers are costlier than other ports in the region for handling containers.

Air Transport

In the civil aviation sector, there are three parts – operational, infrastructural and development. The first is the operational. There are 11 scheduled passenger operator and 1 cargo operator with the combined fleet size of407 aircrafts. There are non scheduled airline operator in the country who have 241 aircraft in inventory .Indian airlines and air India were amalgamated with National aviation company Ltd. However the brand name of air India has been retained. Private

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sector is playing major role in the development airlines as well as airports. Domestic air traffic was earlier equally divided between Indian Airlines and private operators. Now private operators account for 78.5 per cent traffic, Pawan Hans Helicopters Ltd. provides helicopter support service to petroleum sector, state and union territory governments, public sector undertakings and private sector undertakings. International air services are provided by Air India Ltd. and a lot of foreign airlines. Some international services are also handled by the Indian Airlines Ltd.

Airport Authority of India mages 92 airports, including five international airports at Delhi, Mumbai, Kolkata, Chennai and Thiruvanathapuram and 28 civil enclaves at the defense airports.

Regarding regulatory cum development aspect, the Department of Civil Aviation, Government of India, is responsible for it. International services are governed by bilateral agreements. Due to the monopoly nature of the airports and their economic importance, efforts are being made to set up an Independent Airport Economic Regulator for tariff setting and monitoring of performance against standards.

Domestic and international traffic grew by 21.8 per cent and 13.6 per cent and respectively, in the 10^{th} plan. It is estimated that international and Domestic would increase by 16 and 20 % respectively in the 11^{th} plan. International and Domestic cargo recorded a growth of 12.6 % and 12.8% respectively in the 10^{th} plan. This growth is the second highest in the world next to China.

Communication

1. Communication means transmission of information. The important means of communications are the postal services, telephone services, tele printers, radio and television etc. telephone, tele-fax and e-mail have been gradually evolving and telex and telegraph are getting out of fashion.
2. *Postal services* – India's postal system dates back to 1837 and today our postal network is the largest in the world. We have more than 1.55 lakh post offices and out of which around 1.4 lakh are in the rural areas. One post office serves 7174 persons and 21.12 sq. km area. Postal services suffer from many weaknesses such as inadequate number of post offices, use of outdated techniques, delays in reaching of posted material etc. A number of steps have been taken for resolving these problems. Such as speed post, business post, express parcel post, media post, speed post passport etc. services have been introduced. To provide better services, mechanization
3. and computerization of postal operations is being progressively introduced. Presently more than 9600 post offices are computerized. Automatic mail processing centers (AMPC) have been set up at Mumbai and Chennai for faster processing of mails. Two more AMPCs are being set up in Kolkata and Delhi.With a view to improve the speed and volume of money order transmission .140 VSATs(Very Small Aperture Terminal) have been set up. E-post services were started in 2001 in some states. Post offices are also providing a number of financial products such as saving bank and saving certificate, postal life insurance, non life insurance products, mutual funds etc.

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4. *Telecommunications* – Communications all over the world has progressed rapidly and the most important factor accounting for increased communication has been the development of telecommunications which include (i) the telephone service, and (ii) the telex service. India had a total of only 321 telephone exchanges with about 8200 working connections. There were only 338 long distance public call offices and 3324 telegraph offices. The growth of telecommunications has gained momentum after Independences and by March 2009, India had 141 million connections (basic and mobile). With the present growth,the no. of telephones are expected to reach 600 million by the end of 2012. As on March 2007, 5.6 lakhvillges were connected using a village public telephone (VPT). In the rural areas more than 2 lakh public call offices (PCOs) and 113 million phones have been provided.

5. *Although India's telephone network is third largest in the world ,the telephone density continues to be low at about 35.65 %*

6. *A* type of revolution has taken place in the field of telecommunications in recent years. A number of value-added services like radio paging services, cellular mobile telephone service, electronic mail, public mobile radio trunked service, voice mail, video tax, video conferencing etc. have been started. Upto March 09, there were about 376 million subscribers of cellular mobile telephone services. The two PSUs in the telecom sector – Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL) have been losing their market shares in fixed telephony. From 98.65 per cent share in 2001–02, their combined share declined to 85.31 per cent in December, 2005. However, their share in mobile telephony has improved from 3 .98 to 2.11 per cent over the same period. Apart from this, there has been significant growth in the internet connections and broadband subscribers. The internet connections increased from 0.01 million in 1995 to 4.2 million in August, 2007 and broadband subscribers have increased from 0.49 lakh in December 2004 to 6 million march 2009. Regulatory framework and functions are carried out by Telecom Regulatory Authority of India (TRAI) and now the national Internet Exchange of India (NIXI) has been set up to ensure that internet traffic originated and destined for India, is routed within India.

HEALTH AND EDUCATION

HEALTH

For good health, two things are essential:

(a) Balanced and nutritional diet and Medical care.

- The general health standard in India is quite low this is quite inevitable as nearly 1/4th of the population lives below the poverty line.
- Over the years, there has been a fall in the incidence of certain diseases like malaria, polio, T.B and leprosy. But there are also rises in the incidence of certain diseases like AIDS. Blindness, cancer etc.

	1951	1981	2008
Health Centers	725	57353	171687
Dispensaries + Hospitals	9209	23555	33555

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Beds	117198	569495	1175374
Nursing Personnel	18054	143887	1572363
Doctors	61800	268700	Around 7 Lakh

EDUCATION

- India has the second largest education system in the world.
- In New Population Policy (NPP-2000) stress on imparting that education should be free for Children below 14 years of age..
- The National Policy on Education (NPE) was made in 1986 and further modified in 1992. It emphasizes 3 aspects in respect of elementary education:
  (a) NPE had set a goal of expenditure on education at 6% of the GOP.
  (b) Gross Enrolment Ratio (GER) has. Increased progressively from 32.1 in 1950-51 to 96.9% in 2006-07.
  (c) The Sarva Shiksha Abhiyan (SSA) was launched in 2001-02 and resulted in 277000 new schools, 225000 school buildings, 900000 additional classrooms, free Textbooks to8.40 crore children, appointment of 9.66 lakh teachers up to 2008.
- National Program me for Education of Girls at Elementary Level (NPEGEL) is an important component of SSA. This program concentrates on education of girl child.
- Another important component of SSA is the Education Guarantee Scheme + Alternative- and Innovative Education (EGS + AIE).
- There are seven national institutions on technology known 'as Indian institute of Technology. (IIT). These provide courses in engineering and technology.
- There are six Indian Institutes of Management (IIM), which are centers of excellence in Management education.
- For adult education the National Literacy Mission (NLM). Was launched in 1998.
- Number of Higher Secondary Schools also increased from 7416 in1950-51 to 39.44 million in 2006-07.

Problems of India's Education system: -

(a) Unplanned expansion of higher education.

(b) Inadequate number of institutions.

(c) Low standard of education.

(d) Large number of unemployed educated people.

(e) Large-scale migration of educated people to the developed western countries.

(f) Lack of infrastructure in many rural schools· absence of rooms. Blackboard, teachers etc.

(g) Neglect of primary education.

Suggestions for improving the education system

(a) Restrictions should be introduced on higher education.

(b) Education should be made job-oriented.

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(c) Expansion of education should be carefully planned since it is costly.

(d) In rural areas emphasis should be on agriculture and vocational education.

(e) Technical education should be properly planned.

(f) Efforts should be made to stop brain drain i.e.,. highly educated people going abroad in search of jobs.

(g) The standard of education should be raised.

Summary

A peculiar feature of the economic development in India is that the country, without going through industrialization, has jumped to the post-industrial stage.

– Inflation management is one of the hardest tasks an economic policy maker has to undertake. Inflation is a sustained rise in the general level of prices. Price stability is thus considered as an essential condition for economic stability and growth.

– Foreigncapital is typically seen as a way of filling gap between the domestically available supply of savings, plus foreignexchange plus, government revenue and the planned investment necessary to achieve developmental targets.After the announcement of New Industrial Policy (1991), there has been acceleration in the flow of foreigncapital in India.

– The major items in India's export basket are Petroleum products, Engineeringgoods and Gems &Jewellery. These three products together contribute 50 per cent of India's exports.

– The Planning Commission wasset up in 1950 and was entrusted with the responsibility of the creation, development and execution of India'sfive year plans.

– India's five year plans used to be supervised by erstwhile Planning Commission. However, in 2014, India hasannounced the dissolution of the Planning Commission, and its replacement by a think tank called the NITIAayog (National Institution for Transforming India).

– NITI Aayog serves as a "think tank" of the government as a "directional and policy dynamo" and would provideboth to the governments at the centre and in the states with strategic and technical advice on key policy mattersincluding economic issues of national and international importance.

– While the Planning Commission had the power to allocate funds to states for attaining regional development,the NITI Aayog does not have such powers. Rather, the task of allocating funds to states is now being vestedwith the Finance Ministry's Department of Expenditure. Its primary job would be to undertake long term policyand design frameworks and take necessary initiatives for attaining faster development and finally to monitorthese activities sincerely. Thus, NITI Aayog is responsible for actively monitoring and evaluating implementationof the Government programmes and initiatives.

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– The year 1991 will remain a year of notable and widespread changes in the policy for economic development inIndia. In 1991, the Government adopted a number of stabilizationmeasures that were designed to restore external and internal confidence. The government has made someradical changes in its policies regarding foreign investment, trade, exchange rate, industry, banking and fiscalaffairs, etc.These various elements taken together constitute an economic policy. Since July, 1991 Governmentof India has announced several new policies under the name of 'New Economic Reforms'. The new economicreforms gave a new direction and dimension to the Indian economy.
– GST / VAT is a consumption based tax wherein the basic principle is to tax the value addition at each businessstage. To achieve this, tax paid on purchases is allowed as a set off/ credit against liability onoutput/income.

– Demonetization is the act of stripping a currency unit of its status as legal tender.

Some important terms

NITI Aayog: It is the successor in interest to the Planning Commission, superseding the erstwhile Planning Commission with effect from 1st January, 2015.

Planning Commission: A commission delegated to propose plans for future activities and developments of the country for its effective growth.

Green Revolution: The term Green Revolution refers to the renovation of agricultural practices startsMexico in the 1940s. Because of its success in producing more agriculturalproducts
there, Green Revolution technologies spread worldwide in the 1950s and 1960s, significantly increasing the produced per acre of agriculture

HYV: High- yielding varieties (HYVs) are any of a group of genetically enhanced crops such as rice, maize and wheat that have an increased growth rate, an increased percentage of usable plant parts or an increased resistance against crop diseases. High Yielding Variety Seeds are developed to get higher yielding. The main advantages of High Yielding Variety seeds are yielding of farms with the use of HYV seeds in high compared to the use of traditional seeds. These crops formed the basis for the Green Revolution.

Public Investment: It is another name for Government investment.

GDP: Gross Domestic Product that is the market value of all final goods and services produced within a country in a given period.

New Industrial Policy: In the light of worldwide recession, a policy was announced in July 1991, liberalization of economy and globalisation, also aimed at building upon the gains achieved, to correct the distortions, maintain a sustained growth in productivity and gainfulemployment and attain international competitiveness.

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Globalization: A generalized historical process through which more economic activity takes place across national borders. Forms of globalization include international trade (exports and imports),foreign direct investment, international financial flows, and international migration.

GDP Per Capita: The level of GDP divided by the population of a country or region.

C **consumer Price index:** The consumer price index (CPI) is a measure of the overall price level paid by consumers for the various goods and services they purchase. Monthly or annual changes in the CPI provide a good measure of the rate of consumer price inflation.

Development: Economic development is the process through which a country's economy expands and improves in both quantitative and qualitative terms. Economic development requires the coming together of several different processes and conditions: the accumulation of real capital; the development of education, skills, and human capacities; improvements in governance, democracy, and stability; and changes in the sectoral make-up of the economy.

Employment: Employment is a specific form of work, in which the worker performs their labour for someone else in return for a money wage or salary.

Exports: An export is the sale of a product from one country (either a good or a service) to a purchaser in another country.

Imports: Goods or services which are produced in a foreign country and purchased domestically. Imports include money spent on vacations or purchases in foreign countries.

Industrial Policy: Government policies aimed at fostering the domestic development of particular desirable or productive industries, in order to boost productivity, create higher-paid jobs, and enhance international trade performance. Tools of industrial policy can include measures to stimulate investment in targeted industries; trade policies (such as tariffs, export incentives, or limits on imports); and technology policies.

Unemployment: Individuals who would like to be employed, and are actively seeking work, but cannot find a job, are considered "officially" unemployed.

Inflation: A process whereby the average price level in an economy increases over time.

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OBJECTIVE QUESTIONS

1. In an under developed economy the production techniques are generally

   (a) Capital intensive
   (b) Labor intensive
   (c) Both a and b
   (d) Neither a nor b

2. Which index is used to measure inequality of income and wealth

   (a) Gini index
   (b) Price index
   (c) Both a and b
   (d) None

3. Which of the following sector relates to secondary sector?

   (a) Animal husbandry
   (b) Mining
   (c) Transport
   (d) None

4. NSSO stands for

   (a) National sample survey organization
   (b) National savings scheme office
   (c) National standard statistics organization
   (d) None

5. ---------- is measured in terms of life expectancy at birth

   (a) Longevity of life
   (b) Knowledge
   (c) Standard of living
   (d) All of the above

6. In an under developed economy the gini coefficient will be

   (a) Negative
   (b) Zero
   (c) Closer to unity
   (d) Infinity

7. The service sector now accounts for

   (a) More than 80 % of GDP
   (b) More than 70% of GDP
   (c) More than 50% of GDP
   (d) More than 90% of GDP

8. Mark the correct statement

   (a) India is purely capitalist economy
   (b) India is stagnant economy
   (c) India is developing economy
   (d) India is resource poor economy

9. Identify the agro based industry from the following

   (a) Consumer durables
   (b) Petroleum
   (c) Textiles
   (d) Banking

10. There will be ------ demand for industrial product if there is development in rural sector

    (a) Low
    (b) Moderate
    (c) High
    (d) Nothing can be said

11. In periods of crop failure there may be need for

    (a) Making more imports of foodgrains
    (b) Increasing exports of food grains
    (c) Reducing consumption of food grains
    (d) None

12. Green revolution commenced on

    (a) 1946
    (b) 1966
    (c) 1986
    (d) 2006

13. In India foreign exchange outgo from agricultural imports is showing a _____ -trend in absolute terms

    (a) Increasing
    (b) Decreasing
    (c) Constant
    (d) Nothing can be said

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14. Which of the following state have made the least progress in consolidation of land holding

(a) Bihar
(b) Uttar Pradesh
(c) West Bengal
(d) Orissa

15. NABARD was established on recommendations of

(a) Public accounts committee
(b) Shivaraman committee
(c) Narsimhan committee
(d) None

16. Identify which of the following is a part of basic goods industries

(a) Minerals
(b) Fertilisers
(c) Electricity
(d) Plastic

17. Which five year plan is based on Mahalanobis model?

(a) First FYP
(b) Second FYP
(c) Third FYP
(d) Fourth FYP

18. A small scale industrial unit is an enterprise having investment upto 1 crore in

(a) Land and building
(b) Plant and machinery
(c) Fixed assets
(d) Current assets

19. TIFR stands for

(a) Trade in financial resources
(b) Trade in fundamental research
(c) Tata institute of fundamental research
(d) Tata institute of film research

20. ONGC,IOC,SAIL,BHEL are examples of

(a) Large scale units
(b) Small scale units
(c) Public sector units
(d) Both a and c

21. India has ____ largest scientific and technical manpower in the world

(a) Fifth
(b) Tenth
(c) Eighth
(d) Third

22. Which committee recommended simplification and rationalization of tax system in India

(a) Chellia
(b) Boothalingam
(c) Both a and b
(d) Urijit patel

23. Under which of the following tax system more tax is imposed on lower income group

(a) Regressive
(b) Progressive
(c) Value added tax
(d) Proportional tax

24. In Indiamajority of tax is collected through

(a) Direct tax
(b) Indirect tax
(c) No tax
(d) Nothing can be said

25. Which of the following is not include in GDP

(a) Ships and aircrafts operated by the residents of the country between two or more countries
(b) Fishing vessels,oil and natural gas rigs,floating platforms operated by the residents of the country
(c) Embassies ,consulates and military establishments of the country located abroad
(d) Personal investments by residents in abroad

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26. GNP at market price less Net Indirect Taxes equals

(a) GDP at market price
(b) GNP at factor cost
(c) NDP at market price
(d) NNP at factor cost

27. Census of population is done in India at an interval of

(a) 5 yrs
(b) 10 yrs
(c) 15 yrs
(d) None

28. Optimum population is level of population at which

(a) Output per capita is the highest
(b) Output per capita is lowest
(c) Output per capita is constant
(d) None

29. India has about _____ % of the total worlds area

(a) 2.4
(b) 10
(c) 20
(d) 3.3

30. Statistical analysis shows that india's population is growing at the rate of abot _____ p.a

(a) 1.64
(b) 12
(c) 60
(d) 0

31. Population growth rate in India was negative in

(a) 1901-11
(b) 1911-21
(c) 1921-31
(d) 1931-41

32. In India sex ratio in 2011 is

(a) 940
(b) 1050
(c) 700
(d) 853

33. Literacy rate in India is _____ in males than in females

(a) Lower
(b) Higher
(c) Same
(d) Nothing can be said

34. How much has the national income has increases since independence

(a) 16 times
(b) 15 times
(c) 4 times
(d) 2 times

35. According to demographic transition which of the following is third stage

(a) High birth rate ,low death rate
(b) High death rate,low birth rate
(c) high death rate ,high birth rate
(d) low death rate ,low birth rate

36. If capital output ratio is 3:1 and population grows at 2% to ensure 4% increase in per capita income the required capital investment rate will be

(a) 8%
(b) 18%
(c) 28%
(d) 9%

37. Infant mortality rate is highest in

(a) Kerala
(b) Rajasthan
(c) Madhya Pradesh
(d) Mizoram

38. Which state has highest urban population

(a) Uttar Pradesh
(b) Maharastra
(c) Tamil nadu
(d) Rajasthan

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39. According to _____ committee MPCE(monthly per capita expenditure) should be 673 in rural and 860 in urban area

(a) Swaminathan
(b) Rangarajan
(c) Vishwanathan
(d) Tendulakar

40. MGNREGS was established in ___

(a) 2007
(b) 2008
(c) 2009
(d) 2000

41. _____- has been renamed as Aajeevika

(a) IRDP
(b) SGSY
(c) NRLM
(d) MWS

42. ---- and ---- scheme were reconstructed and combined to form SGSY in 1999

(a) UBSB,PMRY
(b) PMRY,SJSRY
(c) IRDP,MWS
(d) None

43. _____ which of the following can remove poverty in india

(a) Population control
(b) Increase in production
(c) Govt subsidies
(d) All of the above

44. VALMIKI AMBEDKAR AWAS YOJNA (VAMBAY) aims at

(a) Construction of roads
(b) Creation of health facility
(c) Construction of affordable housing for urban poor
(d) Construction of dwelling units for slum dwellers

45. Which of the following is not a scheme to reduce poverty

(a) Swarnajayatti gram swarozgar yojna
(b) Sampoorna gramin yojna
(c) Mahatma Gandhi rural employment guarantee program
(d) National rural employment guarantee progarmme

46. You are a factory owner and have given employment to 400 workers if 10 workers are retrenched by you without the loss of production then this situationwill lead to

(a) Open unemployment
(b) Disguised unemployment
(c) Frictional unemployment
(d) Seasonal unemployment

47. When workers are replaced by machines then this type of unemployment is termed as

(a) Technological
(b) Cyclical
(c) Seasonal
(d) Frictional

48. Indian road network is _____ in the world

(a) 2nd largest
(b) 3rd largest
(c) 4th largest
(d) One of the largest

49. Which of the following is top traffic handler

(a) Mumbai
(b) Kolkata
(c) Chennai
(d) Vishakapatnam

50. India accounts for ___% of world's energy consumption

(a) 5
(b) 6
(c) 4
(d) 7

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51. India is _____ largest energy producer in the world.

(a) second.
(b) third.
(c) sixth
(d) seventh

52. Which of the following is the regulatory body of telecom sector

(a) RBI
(b) SBI.
(c) SEBI.
(d) TRAI.

53. The _____ is a non-profit company established in 2003 to provide neutral Internet Exchange Point services in India.

(a) National Internet Exchange of India.
(b) Telecom Regulatory Authority of India.
(c) Neutral Internet Exchange of India.
(d) Central Internet Exchange of India.

54. What of the following is known as International Bank for Reconstruction and Development?

(a) IMF
(b) World Bank.
(c) WTO.
(d) RBI.

55. Which of the following statements is correct?

(a) For every 20 patients in India, there is one doctor.
(b) Kerala has the most favorable sex ratio for women.
(c) According to the World Bank, India is the most developed county of the world.
(d) The public sector's management in India has been passed over to the private sector.

56. Pick up the incorrect statement from the following:

(a) IDA is the soft lending arm of the World Bank.
(b) b) The Bank of India is responsible for declaring the monetary policy of India.
(c) Nearly every Sixth person in the world is an Indian.
(d) India is currently facing a negative Current Account Deficit balance.

57. When inflation occurs due to increasing cost of factors of production, it is called___

(a) demand –pull inflation.
(b) cost- push inflation.
(c) money inflation
(d) stagflation.

58. India had a current account surplus for three successive years. These are:

(a) 2001-04.
(b) 2009-12.
(c) 2005-08.
(d) 2010-13.

59. Which state has the lowest infant mortality ratio in India?

(a) Uttar Pradesh.
(b) Madhya Pradesh.
(c) Andhra Pradesh.
(d) Kerala.

60. The World Trade Organization was specifically established to :

(a) ensure free flow of goods and services across the globe and no trade barriers.
(b) Poor countries have fair share in World Trade.
(c) Countries work through quotas in trade.
(d) ensure peace in the world

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61. What was the code name given to the nuclear test at Pokhran

(a) operation vijay
(b) operation blue star
(c) operation parmanu
(d) smiling Buddha

62. When was Demonetization announced

(a) 6th November 2017
(b) 7th November 2017
(c) 8th november 2017
(d) 9th november 2017

63. GST is _____ tax

(a) Direct tax
(b) Indirect tax
(c) Custom duty
(d) Excise tax

64. Employment guarantee scheme started in

(a) Gujrat
(b) Rajasthan
(c) Maharastrsa
(d) Kerala

65. Most of the disguised unemployment is found in

(a) Agriculture
(b) Industry
(c) Service
(d) All of the above

66. By density of population we mean

(a) Number of people living in 100 square km
(b) Number of people living in 10 square km
(c) Number of people living in per square km
(d) None

67. Which of the following states are most densely populated state

(a) Delhi
(b) Gujrat
(c) Rajasthan
(d) Andhra Pradesh

68. Swarna Jayanti Rozgar Yojna came into operation from

(a) April 1999
(b) June 2000
(c) August 2010
(d) December 1997

69. The C.E.O of NITI AAYOG is

(a) Amitabh kant
(b) Arvind panagariya
(c) Narendra Modi
(d) Arun jaitly

70. When unemployment tends to be long time feature of a country then it is called

(a) Disguised unemployment
(b) Structutral unemployment
(c) Frictional unemployment
(d) Chronic unemployment

71. Electricity generated from water is known as

(a) Hydro electricity
(b) Thermal electricity
(c) Nuclear electricirty
(d) Wind electricity

72. The railway system started in India in

(a) 1853
(b) 1856
(c) 1863
(d) 1893

73. _____ programme was started in 2005 to provide access to electricity to all areas including villages and hamlets

(a) Indira Gandhi grameen vidyutikaran yojna
(b) Rajeev Gandhi vidyutikaran yojna
(c) National grid system
(d) None

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74. Helicopter service to petroleum sector, states & union territories is provided by

(a) Kingfisher services
(b) Sahara services
(c) Pawan hans services
(d) Ambani services

75. In a population of 1000 people, 400 are into labour force ,200 are employed what is the unemployment rate?

(a) 20%
(b) 40%
(c) 50%
(d) 100%

76. If net factor income from abroad is 0 then which of the following is true

(a) GDP>GNP
(b) GDP<GNP
(c) GDP=GNP
(d) NONE

77. National income refers to ___

(a) Net national product
(b) Net national product at factor cost
(c) Net national product at market price
(d) Gross national income minus depreciation

78. Raj , an Indian resident working in USA for an Indian MNC then the income earned by Rajis part of

(a) India's GNP and USA s GDP
(b) India's GDP and USA's GDP
(c) India's GNP and USA's GNP
(d) India' GDP and USA's GNP

79. If expenditure of the government is more than the revenue generated then it is called

(a) Budget deficit
(b) Budget surplus
(c) Balanced budget
(d) All of the above

80. India accommodates ___ % of the world's population

(a) 50
(b) 45
(c) 30
(d) 17

81. The birth rate is high in India because

(a) Predominance of agriculture
(b) Poverty
(c) Lack of education
(d) All of the above

82. Green revolution of 1967 is also known as Wheat revolution due to the bumper production of wheat , what was the other crop?

(a) Bajra
(b) Maize
(c) Millets
(d) Rice

83. Which of the following is not a land reform policy

(a) Consolidation of land holdings
(b) Conservation of forest
(c) Cooperative farming
(d) Abolition of land intermediaries

84. India is in ___ stage of demographic transition

(a) First
(b) Second
(c) Third
(d) None

85. When was GST came to be enacted?

(a) 8th July 2016
(b) 8th July 2017
(c) 8th November 2017
(d) 12 December 2017

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86. What was the reasons given for the DEMONETISATION?

(a) It bring back the black money
(b) It will promote the internet banking
(c) It will reduce the terrorism sponsorship
(d) All of the above

87. Who was the person behind the IT strategy of GST

(a) Narendra Modi
(b) Nandan nilekeni
(c) Narayan murthy
(d) Arvind panagariya

88. India's rank in HDI is

(a) 169
(b) 188
(c) 123
(d) 130

89. What is the PCI of India

(a) 1560$
(b) 1700$
(c) 1200$
(d) 1345$

90. Which of the following nation do not belong to BRICS

(a) Srilanka
(b) Saudi Arabia
(c) Sechelles
(d) All of the above

91. Which of the following nation is the major trade partner of India

(a) China
(b) USA
(c) UAE
(d) All of the above

92. The task of national income estimation is done by

(a) CSO
(b) NSSO
(c) National accounts organization
(d) Indian statistical institute

93. What is the purpose of Udaan Scheme

(a) Encouraging the girls by empowering them through education
(b) Setting up airports at tier two cities
(c) Encouraging girls to take up flight training
(d) None of the above

94. What is Mission Indradhanush?

(a) To prevent the children and pregnant women from seven deadly diseases
(b) To create the spectrum of telecommunication
(c) To build up ports at seven coasts
(d) To connect the seven continent through mega road network

95. What is PMRY?

(a) Prime Ministers rural yojna
(b) Prime ministers rozgar yojna
(c) Prime ministers requirement yojna
(d) None of the above

96. Swarn Jayanti gram swarozgar yojna was launched in

(a) 1999
(b) 1990
(c) 1980
(d) 1970

97. What is the full form of CACP

(a) Commission for agricultural cost and prices
(b) Committee for agro and commercial products
(c) Centre for advanced commercial projects
(d) None

98. _____ provide maximum employment

(a) Agriculture
(b) Industry
(c) Service
(d) Retail

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99. What is Cafeteria Approach?

(a) To sell coffee at every corner
(b) To set up coffee store at every district
(c) A method of selling contraceptives to prevent reproduction
(d) It does not mean anything

100. Which nation got the highest FDI in form of remittances in 2018

(a) China
(b) Japan
(c) India
(d) USA

ANSWERS

1	(a)	**2**	(b)	**3**	(c)	**4**	(d)	**5**	(a)	**6**	(c)	**7**	(c)
8	(c)	**9**	(c)	**10**	(c)	**11**	(a)	**12**	(b)	**13**	(b)	**14**	(a)
15	(b)	**16**	(a)	**17**	(b)	**18**	(b)	**19**	(c)	**20**	(d)	**21**	(a)
22	(a)	**23**	(a)	**24**	(b)	**25**	(c)	**26**	(d)	**27**	(b)	**28**	(a)
29	(a)	**30**	(a)	**31**	(b)	**32**	(a)	**33**	(b)	**34**	(b)	**35**	(d)
36	(b)	**37**	(c)	**38**	(b)	**39**	(d)	**40**	(b)	**41**	(b)	**42**	(c)
43	(d)	**44**	(d)	**45**	(b)	**46**	(b)	**47**	(a)	**48**	(a)	**49**	(d)
50	(a)	**51**	(d)	**52**	(d)	**53**	(c)	**54**	(b)	**55**	(b)	**56**	(b)
57	(b)	**58**	(a)	**59**	(d)	**60**	(a)	**61**	(d)	**62**	(c)	**63**	(b)
64	(a)	**65**	(a)	**66**	(c)	**67**	(a)	**68**	(d)	**69**	(a)	**70**	(d)
71	(a)	**72**	(b)	**73**	(b)	**74**	(c)	**75**	(c)	**76**	(c)	**77**	(b)
78	(a)	**79**	(a)	**80**	(d)	**81**	(d)	**82**	(d)	**83**	(b)	**84**	(b)
85	(b)	**86**	(d)	**87**	(b)	**88**	(d)	**89**	(a)	**90**	(d)	**91**	(d)
92	(a)	**93**	(a)	**94**	(a)	**95**	(b)	**96**	(a)	**97**	(a)	**98**	(a)
99	(c)	**100**	(c)										

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CHAPTER 6 MONEY AND BANKING

Definition of Money

According to Prof. **Walker, "Money is what money does**." That is to say, whatever serves the purpose of money is to be considered as money. According to this view**, functions of money are more important** than that of its concrete form..

Robertson and Seligman have laid emphasis on its basic characteristic, namely**, general acceptability. According to D.H. Robertson, money is" anything which is widely accepted in payment for goods or in discharge of other kinds of business obligations."**

G.D.H. Cole has defined money as "**anything that is habitually and widely used as a means of payment and is generally acceptable in the settlement of debts**."

According to Kent, money is "**anything which is commonly used and generally acceptable as a medium of exchange or as a standard of value.**

Seligman has defined money as **"one thing that possesses general acceptability."**

So we can say

"**Money is a matter of function four**

Medium, measure,standard and store"

Crowther defines money as "anything that is generally acceptable as a means of exchange and at the same time acts as a measure and store of value".

Approaches to the Definition of Money

On the basis of constituents of money, there are following approaches:

Traditional Approach

In the traditional approach, money is regarded only as a medium of exchange. The definition of money emphasises its characteristics like spendability, liquidity, etc. According to this approach money (M) includes currency (C) and demand deposits (DD).

$$M = C + DD$$

All other assets can be considered as money if they are first converted into currency or demand deposits.

Monetarist Approach: T

This approach is associated with Milton Friedman and other Quantity Theorists or monetarists. Friedman defined money as "a temporary abode of purchasing power". According to this view,money can act as a temporary abode of purchasing power, if it is kept in the form of cash, demand deposits or

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any other asset which is close to currency, i.e., near-money asset.
Thus, money (M), according to the monetarist approach, includes currency (C), demand deposits (DD) and time deposits (TD):

$$M = C + DD + TD$$

Time deposits have been included in money on the basis of two monetarist assumptions:

(a) Money has been regarded as having the highest correlation with income,

(b) Money includes all those assets which are perfect substitutes and time deposits are very close substitutes for currency and deposits.

Liquidity Approach:

Gurley and Radcliffe Committee has given liquidity approach to the definition of money. In this approach, the scope of the constituents of money has been further widened to include in money the monetarist definition plus the liabilities of non-banking intermediaries.
Thus, money (M) includes currency, (C), demand deposits (DD), time deposits (TD), saving bank deposits (SB),shares (S), bonds (B) etc.

$$M = C + DD + TD + SB + S + B$$

This approach adopts substitutability criterion to define money as a weighted sum of currency, demand deposits and their substitutes.
Currency and demand deposits have been given unit weight; the assets which are completely unrelated to currency and demand deposits have been given zero weight; the assets which are imperfect substitutes of currency and demand deposits have been given weights between zero and one.

The Central Bank Approach:

The Central Bank approach takes a step further in extending the scope of the constituents of money by regarding money as the total amount of credit extended by a wide variety of sources.
Thus, according to this approach, money (M) includes currency (C), demand deposits (DD), time deposits (TD), credit from non-bank financial institutions (NBFI) and credit from unorganised agencies (CUA):

$$M = C + DD + TD + NBFI + CUA$$

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Liquidity of Money

The economic capacity of an item to be readily acceptable in the market is termed as **LIQUIDITY.** An item cannot have liquidity unless it is marketable**. Liquidity differs** from asset to asset. Cash is the most liquid able asset. Tangible assets are least liquid assets. Non currency financial assets

are also liquid able assets LIQUIDITY is the economic capacity of to be readily acceptable in the market.

Economic activity or level of expenditure in an economy is more a function of overall liquidity than total money stock (currency and demand deposits). The existence of near money asset increases the level of overall liquidity and economic activity. An item cannot have liquidity unless it is marketable.

Factors which determine the liquidity of assets:

1. Frequency of Exchange
2. Selling Cost of asset
3. Probability of Capital Gain/Loss

Types of money through liquidity approach:

1. **Money:** Perfectly liquid asset as it involves no capital gain/loss.
2. **Near Money Assets**: Involve slight capital gain/loss

Thus, we arrive at the conclusion that all these definitions are incomplete and unsatisfactory.

A suitable definition of money must emphasize not only the important functions of money but also its basic characteristic, namely, general acceptability.

Looking from this criterion, we find that **Crowther's definition** is the most suitable one.

He defines money as" anything **that is generally acceptable as a means of exchange (i.e., as a means of setting debts) and that at the same time, acts as a measure and as a store of value."**

Forms Of money

1. Commodity Money
2. Metallic money
3. Paper money
4. Financial instrument (bill of exchange)
5. Legal Tender- That money which every person is legally bound to accept (coins and currency notes not cheques). This is the dominant money.

Functions of Money

Money performs several important functions. It serves as **a medium of exchange, a unit of account, a store of value and a standard of deferred payments**. In addition, money performs certain other functions also. We shall follow Prof. Kinley's division of functions to make a detailed study of all the functions of money.

Prof. Kinley has classified the functions of money into three groups:

(1) Primary functions,

(2) Secondary Functions; and

(3) Contingent functions.

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Primary Functions

In this category are included those most important functions of money which it must perform in an economic system under all circumstances. These are: (1) medium of exchange or means of payment, and (2) measure of value or unit of account.

(1) Medium of Exchange (accepted by all): The most important function of money is that it serves as a medium of exchange or means of payment. For most purchases or sales, money is the accepted medium though which the buyer pays the seller. The use of money thus allows purchase and sale to the conducted independently of one another. The purchase of one good does not require the simultaneous sale of another, as is the situation in a barter system. Hence, money facilitates the exchange of goods and services.

However, everything which serves the purpose of medium of exchange cannot be called money.

(2) Measure of Value (unit of account): The second important function of money it that is can act as a common measure or standard of value or the unit of goods and services. In measuring distance, the meter or foot is the unit of account. By reducing the value of all goods and services to a single unit of account the process of exchange is enormously simplified. Money thus becomes **a common denominator**. Economists call this aspect of money its unit of account function.

Secondary Functions

There are three secondary functions

(1) standard of deferred payments,
(2) store of value, and
(3) transfer of value.

(1) Standard of deferred payments (Future payments (lending and borrowing)): Money also serves as a standard of debt or deferred payments. It is customary to measure the debts or the promises of future payments in terms of money rather than in commodity or services. The reason being that money is expressible in definite and standardized units and its value remains stable over time.

Although it is possible to conceive of debts being expressed in things other than money, these other things are almost certain to be considerably less convenient.

(2) Store of Value (as it is easy to store and spend): Money is a store of value. This means that it is a way to store wealth. It is true that the wealth can be stored even in the form of other assets but its holding in the form of money is better than all the other alternative forms of wealth. The reason being that money has **more liquidity** than any other form of asset. Liquidity means the ability of an asset to be exchanged for something else without loss of time and value. Thus money is a very convenient way to store wealth for use whenever it is needed.

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(3) Transfer of Value (transfer of purchasing power): The third secondary function of money relates to its serving as a medium of transfer of value. It helps us to transfer value form one person to another or from one place to another. Money can affect such transfers easily, quickly and efficiently.

CONTINGENT FUNCTION

(1) Basis of Credit (Cheques, drafts, BOI etc.) Money is the basis of credit. Credit instruments are issued on the basis of cash reserves.

(2) Distribution of national income- National income is distributed among various factors in monetary terms.

(3) General Form of Capital- generally almost all wealth is kept in the form of money which increases the liquidity as well as mobility.

COMMERCIAL BANK

A commercial is that which provide the variety of services including loans, saving account.

Role of commercial bank

Bank offer facilities for keeping saving ∴ encourages saving	Mobilization of saving Saver → Bank → Investor The process of transference of saving to investor by the help of banking network is called mobilization of saving	Credit creation

Function of a bank

Primary Function

Receipt of deposit

(Saving, time and Current deposit)

Lending of money

From: (1) Firm & household
(2) Interest
*Types:*Saving – low interest rate
Current – zero interest rate
Fixed – high interest rate

Forms:
- Cash credit
- Overdrafts
- Loan & advances
- Discounting bills of exchange

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Such as: 1. Collection of bills provisory notes & cheques 2. Collection of dividend interest, premium 3. Purchase of share & securities 4. Acting as trustee	1. Issue letter of credit 2. Travelers cheques, bank draft 3. Safe deposit vaults 4. Trade information 5. Underwriting shares

Secondary Function

(1) Agency services

Collection of bills, payment of loan installment. Insurance
Stock exchange

(2) Other facilities

Lockers etc.

At the time of independence

- India had 645 banks having more than 4800 branch offices.
- These bank generally catered to the needs of industries and that too big one's other priority sector like agriculture, small-scale industries, exports were almost neglected.
- To overcome the deficiencies, the government announced the nationalization of 14 major banks from July, 1969.
- Six more bank were nationalized in 1980.
- Two banks were merged in 1993, so at present. There are 19 nationalized banks

Factors responsible for Nationalization

Economic concentration	Urban bias
All major banks were controlled by one or more business houses. Who use the public money for their benefit? If resulted in economic concentration.	No offices in rural & semi-urban areas. 5.6 lakh villages have only 5000 bank and 5 major cities have 1/7 share & 50% share in bank deposit.

Fact % of advance		
	1951	1968
Industry	70%	87%
Agriculture	2.2% of total advance.	

- Violated the norms and priorities laid down in the plans.
- Extended advances to boarders and block marketers for speculation.
- Neglected – Export, SSI, Agriculture.

Scheduled Commercial Banks (Public Sector)

At present, there are 27 Public Sector Banks in India including SBI (plus its 5 associates) and 19 nationalized banks. Further, there are two banks which have been categorized by RBI as "Other Public Sector Banks". IDBI and Bhartiya Mahila Bank come under this category.

SBI & Associates

State Bank of India with its around 17,000 branches and around 200 foreign offices, is India's largest banking and financial services company by assets. With over 2 lakh employees, SBI is banker to millions of Indians. This bank got birth in the British Era. Its first parents were three presidency banks viz. Bank of Calcutta (later Bank of Bengal), Bank of Bombay and the Bank of Madras. In 1921, these three presidency banks were merged in one entity called "Imperial Bank of India". The Imperial Bank of India was nationalized in 1955 and was renamed a State Bank of India. Thus, State bank of India is the oldest Bank of India.

In 1959, there were eight associates of SBI. The **current five** associate banks of SBI are:

- State Bank of Bikaner & Jaipur
- State Bank of Hyderabad
- State Bank of Mysore
- State Bank of Patiala
- State Bank of Travancore

Apart from the above, the SBI also has seven non-banking subsidiaries viz. SBI Capital Markets Ltd, SBI Funds Management Pvt Ltd, SBI Factors & Commercial Services Pvt Ltd, SBI Cards & Payments Services Pvt. Ltd. (SBICPSL), SBhere are **19 nationalized banks** in India as follows:

1. Allahabad Bank
2. Andhra Bank
3. Bank of Baroda
4. Bank of India
5. Bank of Maharashtra
6. Canara Bank
7. Central Bank of India
8. Corporation Bank
9. Dena Bank
10. Indian Bank
11. Indian Overseas Bank
12. Oriental Bank of Commerce
13. Punjab & Sind Bank
14. Punjab National Bank

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15. Syndicate Bank
16. UCO Bank
17. Union Bank of India
18. United Bank of India
19. Vijaya Bank

Other Public Sector Banks

Further, there are two scheduled commercial banks in India, which have been classified as "other Public Sector Banks". These are

1. IDBI
2. Bhartiya Mahila Bank.

There are 13 old private sector banks as follows:

1. Catholic Syrian Bank
2. City Union Bank
3. Dhanlaxmi Bank
4. Federal Bank
5. ING Vysya Bank
6. Jammu and Kashmir Bank
7. Karnataka Bank
8. Karur Vysya Bank
9. Lakshmi Vilas Bank
10. Nainital Bank
11. Ratnakar Bank
12. South Indian Bank
13. Tamilnad Mercantile Bank

Out of the above banks, the Nainital Bank is a subsidiary of the Bank of Baroda, which has 98.57% stake in it. Some other old generation private sector banks in India have merged with other banks. For example, Lord Krishna Bank merged with Centurion Bank of Punjab in 2007; Sangli Bank merged with ICICI Bank in 2006; Centurion Bank of Punjab merged with HDFC in 2008.

New Private Sector Banks

The new private sector banks were incorporated as per the revised guidelines issued by the RBI regarding the entry of private sector banks in 1993. At present, there are seven new private sector banks as follows:

1. Axis Bank
2. Development Credit Bank (DCB Bank Ltd)
3. HDFC Bank
4. ICICI Bank
5. IndusInd Bank
6. Kotak Mahindra Bank

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7. Yes Bank

Apart from the above, there are two banks which are yet to commence operation. These have obtained 'in-principle' licenses from RBI. They are

1. IDFC
2. Bandhan Bank of Bandhan Financial Services.

Foreign Banks

As of December 2014, there are 43 foreign banks from 26 countries operating as branches in India and 46 banks from 22 countries operating as representative offices in India. Most of the foreign banks in India are niche players. RBI policy towards presence of foreign banks in India is based upon two cardinal principles viz. reciprocity and single mode of presence. more details about regulation of Foreign Banks by RBI, click here

Regional Rural Banks

Regional Rural Banks were started in 1970s due to the fact that even after nationalization, there were cultural issues which made it difficult for commercial banks, even under government ownership, to lend to farmers. **Each RRB is** owned by three entities with their respective shares as follows:

- Central Government → 50%
- State government → 15%
- Sponsor bank → 35%

Headquarters of commercial bank in India

Rank	Headquarter
Allahabad Bank	Kolkata, West Bengal
Andhra Bank	Hyderabad
Bank of Baroda	Vadodara (Baroda), Gujarat
Bank of India	Mumbai, Maharashtra
Bank of Maharashtra	Pune, Maharashtra
Bharatiya Mahila Bank	New Delhi
Canara Bank	Bengaluru, Karnataka
Central Bank of India	Mumbai, Maharashtra
Corporation Bank	Mangalore, Karnataka
Dena Bank	Mumbai, Maharashtra
Indian Bank	Chennai, Tamil Nadu
Indian Overseas Bank	Chennai, Tamil Nadu
Oriental Bank of Commerce	Gurgaon, Haryana
Punjab National Bank	New Delhi
Punjab & Sind Bank	New Delhi
Syndicate Bank	Manipal, Karnataka
Union Bank of India	Mumbai, Maharashtra
United Bank of India	Kolkata, West Bengal

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UCO Bank	Kolkata, West Bengal
Vijaya Bank	Bengalur, Karnataka
State Bank of India	Mumbai, Maharashtra
State Bank of Bikaner & Jaipur	Jaipur, Rajasthan
State Bank of Hyderabad	Hyderabad
State Bank of Mysore	Bengaluru, Karnataka
State Bank of Patiala	Patiala, Punjab
State Bank of Travancore	Thiruvananthapuram, Kerela
Axis Bank	Mumbai, Maharashtra
Catholic Syrian Bank	Thrissur, Kerela
City Union Bank	Kumbakonam, Tamil Nadu
Development Credit Bank	Mumbai, Maharashtra
Dhanlaxmi Bank	Thrissur, Kerela
Federal Bank	Aluva, Kochi, Kerela
HDFC Bank	Mumbai, Maharashtra,
ICICI Bank	Mumbai, Maharashtra
IndusInd Bank	Mumbai, Maharashtra
ING Vysya Bank	Bengaluru, Karnataka
Karnataka Bank	Mangalore, Karnataka
Karur Vysya Bank	Karur, Tamil Nadu
Kotak Mahindra Bank	Mumbai, Maharashtra
Lakshmi Vilas Bank	Karur, Tamil Nadu
Nainital Bank	Nainital, Uttarakhand
South Indian Bank	Thrichur, Kerela
Yes Bank	Mumbai, Maharashtra
UP Agro Corporation Bank	Lucknow, Uttar Pradesh

Short coming of commercial banks in India

Important shortcomings of commercial banks in India as follows:

1. **Insufficient growth–** Considering huge growth of population in the country growth of commercial banks has been insufficient.
2. **Regional imbalance** – There are several regional imbalances in the development of commercial banks in India all the states have not developed equally. Maharashtra, Tamilnadu and West Bengal are more developed states while Assam, Bihar, Arunachal Pradesh and Madhya Pradesh are less developed states.
3. **Increasing of over-dues** – A series problem of commercial banks is that of over-dues and bad debts. A large amount of advance of commercial banks has been over-dues and these banks are incurring heavy losses on account of bad debts. About 50% of total advance of these banks are not recovered.

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4. **Low profitability** – Another serious problem of commercial banks is that most of the nationalized commercial banks are running into loss and the profit of a few profit making nationalized commercial banks is very low when compared to that non-nationalized banks. It may be due to the following causes:
5. **Lower efficiency** – General level of efficiency of staff of nationalized commercial banks is very low when compared to other banks. There is complete lack of the feeling of responsibility and accountability. There is a problem of effective management, control and supervision.
6. **Lack of Expertise** – The public sector banks although entered into merchant banking and agricultural financing, yet they lack expertise in these areas. There is a need of profession tough in these areas.

7. QUANTITY THEORY OF MONEY

Economists have always been interested in answering a two-fold question, namely, what determines the level of prices in general and what causes a variation in it. The Quantity Theory of Money seeks to explain the factors that determine the general price level in an economy. The theory states that the price level is directly determined by the supply of money. There are two versions of **the Quantity Theory of Money:**

1.Transaction Approach. **2. Cash Balance Approach**

Transaction Approach

The transaction approach to the Quantity Theory of Money is given by Fisher which may be explained with thehelp of following equation of exchange.

MV= PT

where, M is the total supply of money
V is the velocity of circulation of money
P is the general price level
T is the total transactions in physical goods

This equation means, in an economy the total value of all goods sold during any period (PT) must be equal to the total quantity of money spent during that period (MV).

Fisher Version/Transaction Approach

Assumptions:

(i) Price level is to be measured over a period of time
(ii) There are no credit sales in the market
(iii) Money is only a medium of exchange
(iv) Each unit of money can change hands several times during the said time intervinterval. Thus, total cashpayment= MV, where: M= Money supply and V= Velocity.
(v) All cash payments received during the year must be equal to the volume of goods and services soldmultiplied their respective prices. Thus, total cash payment=PT, where: P=Price and T=Time period.

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When these two assumptions are made the Equation of Exchange becomes the Quantity Theory of Money which shows that **there is an exact, proportional relationship between money supply and the price level. In other words, the level of prices in the economy is directly proportional to the quantity of money in circulation. That is, doubling the total supply of money would double the price level.**

This version proceeds with the idea that price level is determined by the demand for and supply of money. Fisher also extended the equation of exchange so as to include demand (bank) deposits (M') and their Velocity (V') in the total supply of money. Thus, the equation of exchange becomes:

$$MV + M'V' = PT$$

Or

M = Currency

M' = Bank's money

V & V' = Respective Velocities

Thus, the level of general price level depends on all the five variables of equation.

In the words of Irving Fisher, "Other things remaining unchanged, as the quantity of money in circulation increases the price level also increases in direct proportion and the value of money decreases and vice versa". **If the quantity of money is doubled the price level will also double and the value of money will be one half. On theother hand if the quantity of money is reduced by one half the price level will also be reduced by one half and value of money will be twice.**

Fisher's Transaction Approach can explain the causes of hyperinflation that occurs during war or emergency. It can also explain certain long term trend in prices. But it cannot explain normal peace time inflation. This shortcoming has been modified by the Cambridge version or the Cash-Balance Approach.

Cash Balance Approach

The Cash-Balance Approach to the Quantity Theory of Money may be expressed as:

$$\pi = kR/M$$

where, π = the purchasing power of money

k = the proportion of income that people like to hold in the form of money

R = the volume of real income

M = the stock of supply of money in the country at a given time

This equation shows that the purchasing power of money or the value of money π varies directly with k or R, and inversely with M.

Since $\pi$is the reciprocal of the general price level i.e.

$\pi = 1/P$

If we multiply the volume of real income (R) by the general price level (P), we have the money national income(Y).

M = kY

where, Y is the country's total money income

In the Cash Balance approach k was more significant than M for explaining changes in the purchasing power

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CENTRAL BANK

It is established on April 1, 1935 as a private shareholders bank on the recommendation of Hillton Young Commission. It was nationalized on 1 January 1949. The executive head of the bank is called Governor. The bank has central board of director and four local board at:

Delhi (northern regional office)

Calcutta (eastern regional office)

Madras (southern regional office)

Bombay (westerns regional office)

Role of RBI

- ⇨ It plays important role in strengthening, developing and diversifying the country's economic and financial structure.
- ⇨ Help in maintenance of economic stability and assisting the growth of the economy.
- ⇨ Control monetary policy.
- ⇨ Act as advisor to the government in its economic financial policies.
- ⇨ Act as friend, philosopher and guide to commercial bank.
- ⇨ Deals in government securities.

Functions of Central Bank

(1) **Issue of Notes**: Central bank issues the notes in almost all the countries of the world. Central bank has a virtual monopoly of note issue. In India also, notes are issued by RBI expect one rupee note and coins one rupee note and coins are issued by the government of India but they are handled by the RBI.

(2) **A Banker, Agent, and Advisor to the Government**: Central of a country acts as a banker, an agent and an advisor to the government in this capacity, it performs following functions:

- ⇨ Trustee of government funds,
- ⇨ To maintain the accounts of different government departments
- ⇨ To arrange and mange the issue of public debts,
- ⇨ To regulate and control foreign transactions,
- ⇨ To deal with government securities
- ⇨ To advise the government on-various economic issues,
- ⇨ To give a loan to the government in case of need.

(3) **Banker of Banks:** Central bank of a country is the banker of all other banks working in the country in this capacity, it performs following functions:

- ⇨ To maintain the account of all the banks of the country.
- ⇨ To maintain the cash reserves and liquid reserves of all the banks,
- ⇨ Scheduling of banks and to control the cat ire banking system of the country,
- ⇨ To act as clearing house
- ⇨ To advise the banks on different issues,
- ⇨ To act as the leader of last resort of banks.

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(4) **Credit Control**: An important function of central bank is control the entire credit system of the country. Central bank keeps the creation of credit with in limit through various monetary and fiscal measures. These measures may be qualitative

Quantitative techniques include

- ⇨ Changes in bank rate
- ⇨ Open market operation
- ⇨ Changes in cash reserve ratio
- ⇨ Changes in statutory liquidity ratio

Qualitative techniques include: -

- ⇨ Changes ir margin requirement,
- ⇨ Changes in security requirement,
- ⇨ Regulation of consumer credit,
- ⇨ Credit ceiling, Moral suasion etc.

(5) **Custodian of Gold and Foreign Exchange and Cash Reserves of Commercial Banks**: Central bank is the custodian of gold and foreign exchange reserves of the country. If formulates implements, directs and control suitable gold and foreign exchange policies of the country.

All the commercial banks of the country are requiring to keep certain part of their deposit with central bank as cash reserves. Central bank acts as custodian of these reserves. Central bank uses these are reserves to maintain liquidity of commercial bank to control the quantum of credit and to maintain financial discipline.

(6) **Lender of Last Resort**: Central bank acts as a last resort of other banks as well as government. All the bank of the country as well as government may go to the central bank for loans in the case of need.

(7) **Central Clearance Settlement and Transactions**: Central bank provides the facility of central clearance. In this capacity central bank maintains the accounts of all the member banks settles these accounts and transfer funds from one bank to another. Since the central bank cannot have branches at equal the centers, it entrusts these functions to other big banks.

(8) **Research and Development**: Central bank conducts various surveys, seminars, researches and workshops on different economic problems of the country. Results of these studies help in formulating economic plans and policies.

ONLINE BANKING

Online banking, also known as **internet banking**, **e banking** or **virtual banking**, is an electronic payment system that enables customers of a bank or other financial institution to conduct a range of financial transactions through the financial institution's website. The online banking system will typically connect to or be part of the core banking system operated by a bank and is in contrast to branch banking which was the traditional way customers accessed banking services. To access a financial institution's online banking facility, a customer with internet access would need to register with the institution for the service, and set up a password andother credentials for customer verification. The credentials for online banking is normally not the same as for telephone or mobile banking

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The types of financial transactions which a customer may transact through online banking are determined by the financial institution, but usually includes obtaining account balances, a list of the recent transactions, electronic bill payments and funds transfers between a customer's or another's accounts. Most banks also enable a customer to download copies of bank statements, which can be printed at the customer's premises (some banks charge a fee for mailing hard copies of bank statements). Some banks also enable customers to download transactions directly into the customer's accounting software. The facility may also enable the customer to order a cheque book, statements, report loss of credit cards, stop payment on a cheque, advise change of address and other routine actions. Today, many banks are internet-only institutions. These virtual banks" have lower overhead costs than their brick-and-mortar counterparts.

While financial institutions took steps to implement e banking services in the mid-1990s, many consumers were hesitant to conduct monetary transactions over the internet. It took widespread adoption of electronic commerce, based on trailblazing companies such as America Online, Amazon.com and eBay, to make the idea of paying for items online widespread. By 2000, 80% of U.S. banks offered e-banking. Customer use grew slowly.

Online banking was first introduced in the early1980s in New York, United States.Four major banks — Citibank, Chase Bank, Chemical Bank and Manufacturers Hanover — offered home banking services.

India and e banking

In India e-banking is of fairly recent origin. The traditional model for banking has been through branch banking. Only in the early 1990s there has been start of non-branch banking services. The good old manual systems on which Indian Banking depended upon for centuries seem to have no place today. The credit of launching internet banking in India goes to ICICI Bank. Citibank and HDFC Bank followed with internet banking services in 1999.

Several initiatives have been taken by the Government of India as well as the Reserve Bank to facilitate the development of ebanking in India. The Government of India enacted the IT Act, 2000 with effect from October 17, 2000 which provided legal recognition to electronic transactions and other means of electronic commerce.

Automated Teller Machines (ATMs)

- Internet Banking
- Mobile Banking
- Phone Banking
- Telebanking
- Electronic Clearing Services
- Electronic Clearing Cards
- Smart Cards
- Door Step Banking
- Electronic Fund Transfer

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The three broad facilities that e-banking offers are:

1.Convenience- Complete your banking at your convenience in the comfort of your home
2.No more Qs- There are no queues at an online bank
3.24x7 service- Bank online services is provided 24 hours a day, 7 days a week

Transactions through Retail Electronic Payment Systems

The electronic payment systems such as **Electronic Clearing Service (ECS)** credit and debit and **National Electronic Fund Transfer (NEFT)** have improved the speed of financial transactions across the country. Electronic Clearing Service (ECS) is one of the new electronic banking services. ECS is a non-paper based movement of funds which is encouraged by the RBI on a wide scale. ECS consists of- Electronic Credit Clearing Service & Electronic Debit Clearing Service. ECS brings down administration cost and ensures profitability and productivity to the banks. National Electronic Fund Transaction (NEFT) is a deferred net settlement system and is an improvement over other modes in terms of security and processing efficiency.

Challenges in adoption of E-banking:

E-banking is facing following challenges in Indian banking industry:

1. The most serious threat faced by e-banking is that it is not safe and secure all the time.
2. There may be loss of data due to technical defaults.
3. E-banks are facing business challenges.
4. For the transactions made through internet, the service charges are very low. Unless a large number of transactions are routed over the Web the e-banks cannot think of profit.
5. There is lack of preparedness both on part of banks and customers in the adoption of new technological changes.
6. There is lack of proper infrastructure for the installation of e-delivery channel

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Summary

Money is an important component of the economy. Money was brought into existence to tide over the difficulties of barter system that was the traditional method to trade.
– There are two approaches adopted by economists to define money
– Functional Approach
– Liquidity or Generalized Purchasing Power Approach

The functional approach defines money based on following functions:
– Medium of Exchange
– Measure of Value
– Standard of Deferred Payment
– Store of Value
– Transfer of Value
– Basis of Credit
– Distribution of Social Income
– General Form of Capital
– Maximum Benefit

The liquidity approach provides acceptability of money by creditors in discharge of their claims, and by sellers as sales proceeds, means that money has a generalized purchasing power. The liquidity approach emphasizes the function of money as a store of money.

– Money facilitates the process of credit creation which is the process of inducing and extraction money supply in the economy.

– A bank differs from other financial institutions because it can create credit. The process of 'Credit Creation' begins with banks lending money out of primary deposits.
During the process of credit creation, there arise two important issues which hold utmost consideration, namely profitability and liquidity.

– Quantity Theory of Money seeks to explain the factors that determine the general price level in an economy
– There are two versions of the Quantity Theory of Money:

– Transaction Approach
– Cash Balance Approach

– The overall control of an economy's financial and monetary structure is controlled by the apex institution known as central bank which is Reserve bank of India.

– A commercial bank is a financial institution authorized to provide a variety of financial services, including consumer and business loans, savings accounts etc.

– E-banking is defined as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels.

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– E-banking includes the systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network, including the Internet.

– Customers access e-banking services using an intelligent electronic device, such as a personal computer (PC), personal digital assistant (PDA), automated teller machine (ATM), kiosk, or Touch Tone telephone.

– While the risks and controls are similar for the various e-banking access channels, this booklet focuses specifically on Internet-based services due to the Internet's widely accessible public network.

– By monetary policy, is meant the policy which results in changes in the supply of money. Monetary Policy of a country is the Central Bank's policy for controlling the availability, cost and use of money and credit with the help of monetary measures in order to achieve certain definite goals.
– The monetary policy is implemented by RBI through instruments of credit control. These instruments are classified into two types:
– Quantitative or General Measures
– Qualitative or Specific Measures

– The leading instruments associated with general credit control measures are:
– Bank Rate Policy
– Open Market Operations
– Variable Reserve Requirements
– Repo Rate and Reverse Repo Rate

– Selective credit control measures are exercised through issuing specific instructions to the banks.

Some important terms

Barter System Barter System is that system in which goods are exchanged for goods. In ancient times when money was not invented trade as a whole was on barter system.

Functional Approach The approach to define money based on the functions of money.

Liquidity Approach The approach to define money based on its characteristic of liquidity.

Deferred Payment A debt which has been incurred and will be paid back at some point in the future.

Purchasing Power The ability to purchase which is generally measured by income. The value of money, as measured by the quantity and quality of products and services it can buy. It is also called buying power.

Financial An establishment that focuses on dealing with financial transactions, such as

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Institutions investments, loans and deposits. Conventionally, financial institutions are composed of organizations such as banks, trust companies, insurance companies and investment dealers.

Digital certificate The electronic equivalent of an ID card that authenticates the originator of a digital signature.

E-Banking The remote delivery of new and traditional banking products and services through electronic delivery channels.

Firewall A hardware or software link in a network that relays only data packets clearly intended and authorized to reach the other side.

Hacker An individual who attempts to break into a computer without authorization.

Internet The global system of interconnected computer networks that use the Internet protocol suite (TCP/IP) to link billions of devices worldwide.

Kiosk A publicly accessible computer terminal that permits customers to directly communicate with the financial institution via a network.

Legacy systems A term commonly used to refer to existing computers systems and applications withwhich new systems or applications must exchange information.

Smart cards A card with an embedded computer chip on which information can be stored and processed.

Wire transfer Often used to refer to any electronic transfer of money from one person to another

Monetary Policy The actions of a central bank, currency board or other regulatory committee (monetary authorities) that determine the size and rate of growth of the money supply, which in turn affects interest rates.

Minsky moment sudden major collapse of asset values which is part of the credit cycle or business cycle.

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OBJECTIVE QUESTIONS

1. Functions of money do not include:
   (a) Medium of exchange
   (b) Store of value
   (c) Measure of value
   (d) Employment exchange

2. Demand deposits are considered as money because
   (a) They are generally accepted as means of payment
   (b) More liquid than cash
   (c) Held by government
   (d) Managed efficiently by bank managers

3. When we say that money ensures conversion of savings into investment we are considering the _____ aspect of money
   (a) Static
   (b) Dynamic
   (c) Both a and b
   (d) Neither a nor b

4. In 1979 as per RBI's new classification M_3 is known as
   (a) Narrow money
   (b) Broad money
   (c) Near money
   (d) Pure money

5. NM_1 in the money stock in india refers to
   (a) Post office savings deposits
   (b) Total post office deposits
   (c) Currency plus demand deposits plus other deposits with RBI
   (d) Time deposits with bank

6. 14 major commercial banks were nationalized in 1969 and _____ more banks were nationalized in 1980,two banks were merged in 1993 so at present there are _____ nationalised banks in India
   (a) 2,18
   (b) 5,21
   (c) 4,16
   (d) 6,19

7. Which of the following states lead in deposit mobilization
   (a) Maharastra
   (b) Gujrat
   (c) Madhya Pradesh
   (d) Bihar

8. Banking ombudsman means
   (a) Person appointed to recover dues from defaulting borrowers
   (b) A person to whom customers can approach for redressal of their grievances
   (c) A person appointed to settle disputes between employees and management
   (d) A person appointed by RBI to oversee the functioning of foreign banks

9. To reduce the value of domestic currency in terms of foreign currency is known as
   (a) Appreciation
   (b) Devaluation
   (c) Depreciation
   (d) None

10. RB I was nationalized in_____
    (a) 1949
    (b) 1959
    (c) 1969
    (d) 1979

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11. Credit creation by commercial bank will decrease if

(a) Ability to save increases in the economy
(b) Reserve ratio increases
(c) New banks enter into the banking fraternity
(d) There are few leakages in the economy

12. If there is inflation in the economy then which of the following policies should be taken by RBI

(a) Decreases CRR
(b) Increases CRR
(c) Increases SLR
(d) Both b and c

13. When Repo Rate increases borrowing from RBI becomes more____

(a) Cheaper
(b) Expensive
(c) Borrowing from RBI is not possible
(d) Cannot say

14. If government wants to boost investment and production it will _____ bank rate

(a) Increases
(b) Decreases
(c) Constant
(d) cannot say

15. Credit rationing is _____ policy

(a) quantitative
(b) qualitative
(c) both
(d) none

16. Bad and doubtful debts of scheduled commercial banks are known as

(a) withdrawal of assets
(b) non performing assets
(c) non recoverable assets
(d) none

17. Due to opening of new branches in the economy the population per bank has

(a) increased
(b) decreased
(c) remained constant
(d) nothing can be said

18. FEMA stands for

(a) foreign exchange management act
(b) funds exchange management act
(c) foreign exchange mismanagement act
(d) foreign exports management act

19. EXIM bank started in

(a) 1972
(b) 1988
(c) 1982
(d) 1998

20. Which of the following statements about central bank is incorrect?

(a) Central bank regulates currency in accordance with the requirements of business and the general public.
(b) Central banks performs general banking and agency service for the state.
(c) Central bank generally deals with the public and tries to encourage saving habits among people
(d) None

21. RTGS stands for

(a) Rational theory of government services
(b) Real time gross services
(c) Real time gross settlement
(d) Rupee through government scheme

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22. Fisher gave _____ approach of quantity theory of money

(a) Transaction approach
(b) Cash balance approach
(c) Both
(d) None

23. Central bank of India has ___ branches

(a) 22
(b) 32
(c) 19
(d) 20

24. Which of the following has unlimited legal tender

(a) Cheque
(b) Demand draft
(c) Paper currency
(d) Fixed deposits

25. If ₹ 20000 is deposited in the bank and out of it 10% is kept as reserve then how much is amount meant for secondary account and how much is the credit created

(a) 200,18000
(b) 18000,21000
(c) 18000,18000
(d) 18000,200000

26. An item cannot have liquidity unless it is marketable.

The statement is

(a) True
(b) False
(c) Partly true
(d) Partly issue

27. Suppose a bank accepts deposits @6% whereas it provides loan @9%,how much credit will be created by bank?

(a) 6%
(b) 3%
(c) 1.5%
(d) None

28. MV=PT is given by

(a) Cambridge
(b) Fisher
(c) Former H
(d) F gardner

29. During the second world war,bidies came to perform the function of money although

(a) It did not work as a medium of exchange
(b) It did not work as a store of value
(c) It did not serve as a standard of deferred payments
(d) It was not declared a legal tender

30. A commercial bank normally does not pay interest on

(a) A fixed deposit with the bank
(b) A current deposit with the bank
(c) A saving deposit with the bank
(d) Long term deposit with the bank

31. Which of the following were merged with State bank of India in 2016

(a) State bank of Patiala
(b) State bank of Bikaner and Jaipur
(c) State bank of Hyderabad
(d) All of the above

32. Which of the following is considered as one of the old private bank of India

(a) Bank of baroda
(b) Canara bank
(c) Laxmivilas bank
(d) Allahabad bank

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33. Which of the following bank is subsidiary of Bank of Baroda

(a) Dhanalaxmi bank
(b) City bank
(c) Ratnakar bank
(d) Nainital bank

34. Centurian bank of Punjab merged with _____ in 2008

(a) Bank of Patiala
(b) Bank of Punjab
(c) HDFC
(d) ICICI

35. Which of the following bank came into existence in 2016

(a) Karur bank
(b) Jammu and Kashmir bank
(c) Bandhan bank
(d) All of the above

36. Greshams law states that

(a) Money and price are inversely related
(b) Money and price are directly related
(c) Bad money drives out good money
(d) Good money drives out bad money

37. If the quantity of money is doubled then according to quantity theory of money the price will be

(a) Doubled
(b) Halved
(c) Remain constant
(d) Cannot say

38. Fiat money is that

(a) Which is accepted by the overseas bank
(b) Money which is accepted as legal tender by government
(c) Stabilized by monetary authority
(d) None

39. During depression it is advisable

(a) Increase CRR and decrease bank rate
(b) Decrease CRR and increase bank rate
(c) Increase bank rate and decrease CRR
(d) Decrease CRR and decrease bank rate

40. Banks can create credit

(a) On the basis of their deposits
(b) On the basis of their securities
(c) On the basis of their total assets
(d) Out of nothing

41. Who is called the bank of issue

(a) Bank of Baroda
(b) Bank of issue
(c) State bank of India
(d) Reserve bank of india

42. Which of the following is not method of quantitative credit control

(a) Bank rate
(b) Repo rate
(c) Reverse repo rate
(d) Margin requirements

43. The present ten rupee note is issued by

(a) Government of India
(b) Reserve bank of India
(c) Commercial bank according to the need of the region
(d) Any of the above

44. The headquarter of Allahabad bank is at

(a) Allahabad
(b) Kolkata
(c) Mumbai
(d) Bangaluru

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45. If the primary deposits increases then the total amount of credit created will

(a) Increases
(b) Decreases
(c) Constant
(d) cannot say

46. Bank credit is the liability of

(a) Banking system
(b) Public
(c) Government
(d) Both public and government

47. _____ forms the largest portion of banks working capital

(a) Share capital
(b) Reserve funds
(c) Deposits from general public
(d) Investments
(e)

48. The cash balance approach can be written as

(a) MV=PT
(b) M=kpy
(c) M= kpr
(d) Π= kr/M

49. Credit is a _____ concept

(a) Flow
(b) Stock
(c) Both and b
(d) None

50. Demant account is related to

(a) Deposits
(b) Term deposits
(c) Credit
(d) Shares

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ANSWERS

1	(d)	**2**	(a)	**3**	(b)	**4**	(b)	**5**	(c)	**6**	(d)	**7**	(a)
8	(b)	**9**	(c)	**10**	(a)	**11**	(b)	**12**	(d)	**13**	(b)	**14**	(b)
15	(b)	**16**	(b)	**17**	(b)	**18**	(a)	**19**	(c)	**20**	(c)	**21**	(c)
22	(a)	**23**	(a)	**24**	(c)	**25**	(d)	**26**	(a)	**27**	(d)	**28**	(b)
29	(d)	**30**	(b)	**31**	(d)	**32**	(c)	**33**	(d)	**34**	(c)	**35**	(c)
36	(c)	**37**	(a)	**38**	(b)	**39**	(d)	**40**	(c)	**41**	(d)	**42**	(d)
43	(b)	**44**	(b)	**45**	(a)	**46**	(a)	**47**	(d)	**48**	(d)	**49**	(b)
50	(d)												



TIME FOR NKJ-CLASS TEST !



Dear NKJ Student !

Please Request your Faculty to Conduct Test of Past Chapter and ensure that the test is surely conducted.

Its mandatory !

"Practice makes a man perfect"

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CHAPTER 7 DESCRIPTIVE STATISTICS

FUNCTIONS OF STATISTICS:

1. **Preciseness and Definiteness:** Statistics presents the facts in a precise and definite form. For example, the statement that the total population of a particular city has increased from 40 lakhs to 60 lakhs during 2000-2010 is more precise and conclusive than the statement that the total population of a particular city has increased during 2000-2010.
2. **Simplification of large and complex data in understandable form:** Statistics presents large volume of complex data in meaningful and understandable form.
3. **Comparison:** Statistics makes the comparison of particular phenomenon possible through various techniques like averages, time series, index numbers etc. comparison enables us to understand the behaviour of data over a given time period.
4. **Enlarge knowledge and experience:** Statistics provides opportunities to enrich knowledge and experience with the help of statistical techniques and methodology.
5. **Formulation of policies:** Statistics facilitates the formulation of various economic e.g. fiscal and monetary businesses, individual policy and other policies (health and education) at state, national or global level. Business organizations also make use of statistics in the formulation of policies in the area of finance marketing and personnel.
6. **Business forecasting:** Forecasting refers to the process of predicting future events. Statistics facilitates business forecasting through various techniques as time series, extrapolations etc.

LAWS OF STATISTICS

There are two important laws of statistics on which whole theory of sampling is based. These two laws are:

- Law of Statistical Regularity
- Law of inertia of a Large Numbers

APPLICATION OF STATISTICS:

1. **In the State:** Statistics provides statistical information to the state to frame the suitable polices and guidelines to maintain law and order to promote human welfare and to improve the overall working of the system. For example, statistics provide information to the state:
   (a)
2. **In Economics:** Statistics provides statistical information to answer the three basic questions in the economics i.e. what to produce, how to produce and for whom to produce, specifically, statistics helps:
   (a) To test the economic theories in the areas of consumption, production, exchange, distribution, saving, investment, etc, empirically.
   (b) To understand and study economic problems such as problem of inflation, cost of living etc.
   (c) To frame economic planning models.

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(d) To measure national income and its components like, income, saving, investments, expenditure, etc.

3. **In Management and Industry:** Statistics provides statistical information and statistical techniques such as probability, sampling, forecasting etc. to the management and thus enable the management to discharge the functions of planning, organizing, controlling and communicating smoothly. For example, statistics help in the business management and industry in various areas such as:
   (a) Location of plant
   (b) Size of plant
   (c) Production planning
   (d) Quality control
   (e) Finance decisions
   (f) Marketing decisions
   (g) Personnel decisions
   (h) Purchase decisions
   (i) Sales decisions
   (j) Accounting decisions

Origin of the word statistics are:

Latin word : Status
Italian word: Statista.
German word : Statistik
French word : Statistque

- The word **'Statistics'** is commonly used in two ways either in a plural sense or in a singular sense.
- **In plural sense,** statistics is defined as data qualitative as well as quantitative, which are collected usually with a view to having statistical analysis.
- **In singular sense,** statistics is defined as the scientific method that is employed for collecting, analyzing and presenting data leading finally to drawing statistical inferences about some important characteristics.
- Statistics deals with aggregate.
- Statistics concerned with quantitative data.
- The theory of statistical inference is a built upon random sampling.

Nature ofStatistics

Statistics is both science and arts.

Statistics is science because of

a) It is systematic
b) Establishes cause and effect
c) Its laws are universal in nature
d) Statistics help other science to derive their own laws

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Statistics is arts because of

a) It is knowledge put into action
b) It helps in better understanding and deriving optimum solution to the real life problems

Classification of Statistics

a) Descriptive statistics: deals with numerical data. example: averages,skewness, dispersion
b) Applied statistics: covers those statistical methods and techniques that deals with real life situation.example : index numbers, sample survey, quality control
c) Inferential statistics: comprises of those techniques that deals with conclusions and inferences about that parameters of population on the basis of estimates derived from sample. Example : chi-square test,F-test
d) Inductive statistics: covers those techniques and methods that tries to estimate a particular phenomenon on the basis of random observation. Example :extrapolation
e) Mathematical statistics : concerned with mathematical techniques such as integration , differentiation.
f) Analytical statistics: comprises of those methods which are used in establishing functional relationship between variables. example : correlation , regression

Stages of statistical enquiry

a) Collection of data
b) Classification and organization of data
c) Analysis of data
d) Interpretation of data

DATA COLLECTION

Data are quantitative and qualitative. Data are secondary and primary.

Primary Data

Data collected originally for the present investigation are referred to as primary data. Sources from where these data are gathered are known as primary sources.

Sources of Primary Data

Observation:

It means observation is the only method of collecting exact and accurate data. But this technique is quite demanding in terms of time, expense, and patience and covers only a small area.

Interviews:

Personal; Telephonic and indirect: Sometimes, the interviewer himself asks the questions and records the response. This is called personal interview. In case of natural calamity, data can be collected very fast by this method. Indirect interview is conducted from people associated with the problem. In case of accident, direct personal interview is not possible but indirect interview is possible.

Another type of interview is telephonic: These days telephonic interviews have become very common and use of mobile phones has further increased its popularity. It is often used for small or repetitive interviews.

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Questionnaire

Questionnaire refers a set of printed questions along – with space for answers. This set is handed over to the individual who is asked to record his/her response to the questions. Since a questionnaire is designed to seek responses from others, lot of precautions should be exercised in its drafting.

Mail (Or Email) Questionnaire:

These days Email has becoming very popular and convenient. Questionnaires are emailed and great savings of time and money is made. Respondent also email the answers. However, sometimes the response rate may be less compared to the personal interviews.

SECONDARY DATA

Data, which were collected earlier for purposes other than the present investigation, are known as secondary data.

SOURCES OF SECONDARY DATA

Secondary data are collected from internal and external sources and such sources are referred to as secondary sources. They may be available in the form of printed papers, books, articles, newspapers, CDs or on Internet.

Internal sources include such sources that belong to the organization with which the decisions maker is associated.

External sources refer to all sources that are outside the organization of the statistician. There are number of international and national organization which collect and dispense a sizable volume of statistical information.

United Nations, OECD, OPEC, SARC, ASEAN are some of the important sources of data at international level. UN statistical year book, annual reports of IMF, ILO, WHO, OECD country studies, are some of the prominent sources of data. These are available in the form of published books or periodicals or CDs.

At the national level government departments/ ministries such as Central Statistical organization provide large amount of data. In addition, Five Year Plans, Economic Survey, Report on Currency and Finance, RBI Bulletin, Monthly Statistics of imports and exports, annual reports of ministries are some of the major external sources in India. Some special organization like NCAR and trade associations (such as FICCI, CII) are important external sources.

Ministries of the state governments and local bodies like Delhi Development Authority, Municipal corporation of Delhi or village panchayats also provide data. Some big companies like Steel Authority of India, or banks such as State Bank of India also publish data.

Cautions in using Secondary Data

Before using the above data, one should know their limitations. One should be aware of the techniques of data collection and errors of omission, commission, transmission that are often associated with them.

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Census vs Sampling

Census investigation is used to collect primary data. Data is collected from each and everey unit of the population which is a complete set of items which are of interest in any particular situation.

Merits of census

a) Intensive study
b) Reliable data
c) Suitable choice
d) Basis of various surveys

Demerits of census

a) Costly method
b) Time consuming
c) Possibilities of errors
d) Personal bias

Sampling investigation means studying a part of the total population to draw conclusion about the total population.

Objectives of sampling

a) To reveal the characteristics of the total population
b) To estimate parameters of population
c) To test the validity of the statement about the population
d) To investigate the changes in the population

Requirements of sample investigation

a) Representativeness
b) Adequacy
c) Independence
d) Homogeneity

Merits of Sampling :

a) Less costly
b) Less time consuming
c) Reliability
d) Detailed information
e) Flexibility

Demerit of sampling

a) problem of accuracy
b) random errors
c) results not reliable
d) biasness of the investigators
e) cannot be used if population is heterogeneous

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PRESENTATION OF DATA

In the process of decision – making, vast variety of data has to be gathered from numerous sources. To understand them clearly they need to be simplified and classified.

Classification of data refers to the division of data into some classes. Similar types of data are grouped in one class.The purpose of classification is to ensure that data be grouped and presented in a manner so that their analysis can be conducted properly. It can be summarized as follows :

i) It condenses the data and ignores unnecessary details;

ii) It facilitates comparison between data;

iii) It help in studying the relationships between several characteristics;

iv) It facilitates further statistical treatment.

Data can be classified into four categories:

Quantitative Classification: These are such facts that cannot be measured on natural numerical scale but are grouped on the basis of some distinctive characteristics. Fairness of skin of India girls.

Chronological Classification: Sometimes data are classified according to time. For example, exports of a firm in different years; agricultural production in India in various seasons.

Geographical Classification: Data are also arranged according to the geographical boundaries. Number of cars in India, Nepal, Pakistan, etc., is an example of geographical classification.

Qualitative classification: when data is classified on the basis of attributes like beauty,honesty etc

FREQUENCY DISTRIBUTION

Frequency distribution refers to the division of quantitative data either individually or into different groups on the basis of their magnitude. In other words, it is can arrangement of ordered array in a manner so that data are written along with their frequency/frequencies. Formation of frequency distribution is essential for the purpose of proper analysis of data.

This arrangement in done in the form of three series:

- ✓ Individual series
- ✓ Discrete series
- ✓ Continuous series

When the data set consists of few variables, it is arranged in an ordered array. Ordered array is the arrangement of data in either ascending or descending order. It facilitates observation and inspection of data. For example, the amount collected by a pathological laboratory from the first seven patience on a certain day was ₹ 230, 70, 180, 550, 490, 210, and 340. These are called raw data but their ordered array is 70, 180, 210, 340, 490, and 550. This arrangement is known as individual series. In an individual series, generally, the number of data are less and non – repetitive.

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Another arrangement of discrete data is known as discrete series. It is made from discrete data. Discrete data are such which jump by a finite value, like number of doctors in difference between colonies in a metropolitan city are 15, 9, 24, or 11, but not 13.33, or 6.24. In discrete series, generally, variables are repeated. Number of times a variable is repeated is called its frequency denoted by f. An example of discrete series:

No. of burgers sold (X)	1	2	3	4	5	6
No. of customers (f)	13	27	45	33	18	4

Continuous series is formed from continuous variables. Continuous variables are such which vary over a continuous scale. For example, marks of undergraduate students, profits of different firms, fluctuation in share prices of some firms in a day in the National Stock Exchange, etc., are cases of continuous variables. Continuous series is an arrangement of data into classes and against each class its frequency is mentioned. This element can be either fractional or whole, classes are mutually exclusive and exhaustive.

$$k=1+3.322 (\log n)$$

Where k = number of classes

n = number of variables

Class width:

Class width refers to the difference between the upper and lower limit of a class. It is advisable to have classes of common width for appropriate comparison of data. The formula for deciding class width :

$$\text{Range} = \frac{\text{Largest Value} - \text{Smallest Value}}{\text{Number of classes}}$$

This is called a common class interval.

Profits (in ₹ Millions)	10-20	20-30	30-40	40-50	50-60
No. of firms	36	45	68	19	12

However, sometimes we may come across such a frequency distribution that has uncommon class intervals.

Marks obtained	***No. of students***
10 -15	12
15 -30	18
30 - 50	25
50 - 75	23
75 - 100	2

Class Limits:

Each class has two limits – known as the lower limit and the upper limit. For the first class in the example of profits of the firm, the lower limit is 10 and the upper limit is 20. since the upper limit number is excluded in all the classes, such a series is known as exclusive type of continuous series. For statistical analysis, such an arrangement is preferred. The average of the lower and

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the upper limit of a class is known as its mid – point. For the first class the mid – point is 15, calculated as

$$\frac{\text{Lower limit} + \text{Upper limit}}{2} = \frac{10+20}{2} = 15$$

Mid-point is considered as the representative value of the frequencies of this class.

There is another type of continuous series known as inclusive type. Its limits are called class boundaries.

Example:

Daily wages	*No. of workers*
50 - 99	8
100-149	14
150-199	27
200-249	11
250-299	4

For the purpose of statistical analysis inclusive type frequency distributions should be converted into exclusive type. The procedure is:

$$Q = \frac{\text{Lower limit of the second class} - \text{Upper limit of the first class}}{2}$$

Subtract Q from all lower limits and add to all upper limits. This process coverts an inclusive series into an exclusive series.

Open – ended classes: If the first class is written as Less than 10, subsequent classes are written as 10 – 20; 20 – 30; ....., and the last class is written as 90 and above; such an arrangement is referred to as open ended classes.

Cumulative Frequency Distributions

Cumulative frequency distribution refers to such distribution where frequencies are presented in a cumulative manner. It can be of two types – less than type or more than type.

Less Than Type Cumulative Distribution

Classes	*Frequencies*
Less than 10	5
Less than 20	14
Less than 30	32
Less than 40	58
Less than 50	88
Less than 60	96
Less than 70	100

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Except for the first class, frequencies of all other classes are cumulative. For the purpose of descriptive analysis, the above less than type cumulative distribution has to be converted into exclusive type series.

Classes	*Frequencies*
Less than 0	100
Less than 10	95
Less than 20	86
Less than 30	68
Less than 40	42
Less than 50	12
Less than 60	4

More than type cumulative distribution is converted into exclusive type of distribution by first drawing the class limits and then finding the simple frequencies for each class. Since the gap between the first and the next class is of 10, therefore, the class interval be taken as 10.

Frequency density of a class interval

It is the ratio of the frequency of a class interval to the corresponding class length e.g., 13/10; 24/10, etc.

Mode of presentation of data:

1) Textual presentation of data.
2) Tabular presentation.
3) Graphic or diagrammatic presentation.

TEXTUAL PRESENTATION

Data presented in paragraph/paragraphs. Simple method, no need to have any special knowledge of statistics. conversation with exact magnitude can be presented in this way. This is the first method or beginning for other methods. However, it is not preferred by statistician because it is dull, monotonous and cannot be used for comparison.

TABULAR PRESENTATION

Presentation of data in the form of table is very useful. The following points should be kept into consideration while constructing a statistical table :

1) **Table Number:** Every table is allotted a number.
2) **Heading:** Every table should be given a heading. It should not be too lengthy.
3) **Head – note:** At the right – hand side of the top of the table a head – note may be given to specify the units of measurement.
4) **Captions and stubs:** Data in statistical tables are given in columns and rows. Column headings are known as captions and row headings are known as stubs.
5) **Body of the table:** This is the main part of the table and contains all data. The numbers of the columns and rows of the table should be such that all information may be easily fit in.
6) **Footnote:** If some explanation is required to be given about a particular figure, it may be given in the footnotes.

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7) **Source:** if data are collected from some secondary source, it is better to mention the details of such a source.

A blank Performa of the table is given below :

TABLE NO.

Heading.....

(Head Note)

Stub	Captions	
	Body of Table	Row Total
total	Column Total	Grand Total

Source:

Footnotes:

Example: Tabulate the following information giving title:

In a trip organized by a college, there were 160 persons each of whom paid ₹15.50 on an average. There were 120 students each of whom paid ₹16. Members of the teaching staff were charged at a higher rate. The number of servants was 12 (all males) and they were not charged anything. The number of ladies was 20% of the total of which 2 were lady staff members.

Solution:

Heading: particulars of trip organized by a college

	Males	**Females**	**Total Number**	**Average Amt.**	**Total Amt.**
Students	90	30	120	16	1920
Teachers	26	2	28	20	560
Servants	12	-	12	-	-
Total	128	32	160	15.50	2480

The tabular presentation is preferred to textual presentation as:

1) It facilitates comparison rows and columns
2) Can be used to present complicated data
3) It is a prerequisite for diagrammatic presentation
4) It is necessary for statistical analysis of data.

GRAPHIC PRESENTATION

One of the most popular manners of presenting data is through graphs. They are quite eye – catching and well understood by common people who do not have sound statistical background. Any hidden trend present in the data can be noticed only through diagram but compared to tabulation this is less accurate. Data can be presented through a large variety of graphs. While drawing a diagram appropriate horizontal and vertical scales should be chosen. The drawing should be neat and simple.

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Line diagram

Values are represented by either vertical or horizontal lines. The length of a line varies as per the value. Distance among various lines is arbitrarily fixed and the same distance is maintained among all lines.

Example: Represent the export figures for a period of ten years for ABC PLC.

Years	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Export (in ₹ crores)	12	26	32	48	45	56	37	22	28	39	51

Solution: (Try it out yourself)

Bar diagram

Diagrammatic presentation of data is very popular in business presentations and has become a favourite technique in case of computer presentations. There are a number of bar diagrams some of them, which are more in use, are explained here.

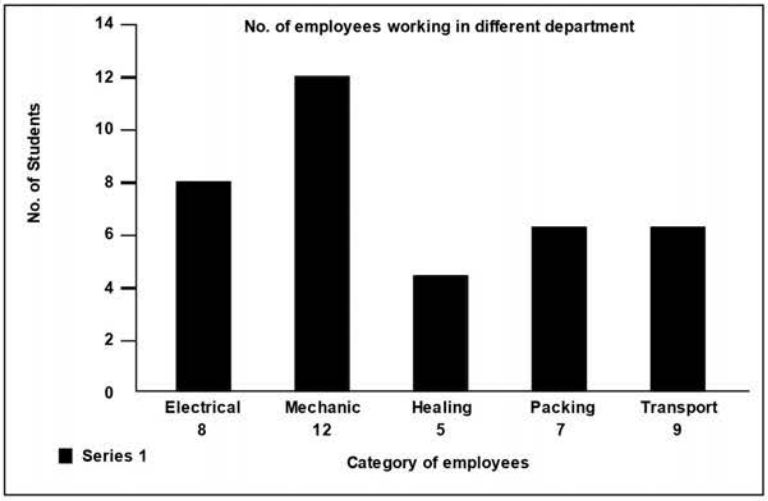
Single Bar Diagrams

To show individual values of a single type we draw single bar diagrams. The height of the bar depends upon the value. Width of all the bars is taken to be equal and the gap between different bars is the same. Single bar diagrams can be drawn vertically or horizontally. Through single bar diagrams one can show quantitative data as well as qualitative attributes.

Example: The following figures represent the number of employees working in difference departments in a manufacturing company in a particular year. Present these figures through single bar diagram (horizontally and vertically).

Category of employees	*No. of employees*
Electrical department	8
Mechanical department	12
Heating department	5
Packing department	7
Transport department	9

Solution:



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Multiple Bar Diagrams

When more than one feature of an observation or time are to be shown simultaneously, such a presentation is done through multiple bar diagrams. For example, if we want to show the number of male and female students who appeared for different categories of ICAI examinations in May, 2004, multiple bar diagrams are a suitable technique. Like single bar diagram, they can be shown horizontally as well as vertically. Height of each bar depends upon the number of items in each observation.

Example: Draw a multiple bar diagram (horizontal and vertical both) from the following information:

Number of male and female students appeared in May, 2004 examinations of ICAI, Delhi :

	P.E.-I	P.E.-II	FINAL
Male	32,000	18, 000	24,000
Female	8,000	15,000	16,000

PIE CHARTS

In pie chart a circle (pie) is drawn to represent data. Sum of all data is equated to 360 degrees and each data is converted into degrees. Then data are plotted in the circle in proportion to their degrees. Pie charts are often used to represent the budgetary allocations to various departments of the government of India, expenditure on different groups in a family, etc.

Example: The following table gives the distribution of outlay in a Five Year Plan of India under the major heads of development expenditure :

Head of expenditure	**Expenditure (in crores of ₹)**
Agriculture and community development	8,000
Irrigation and power	4,000
Industry and mining	7,000
Transport and communication	5,500
Miscellaneous	2,500
Total	**27,000**

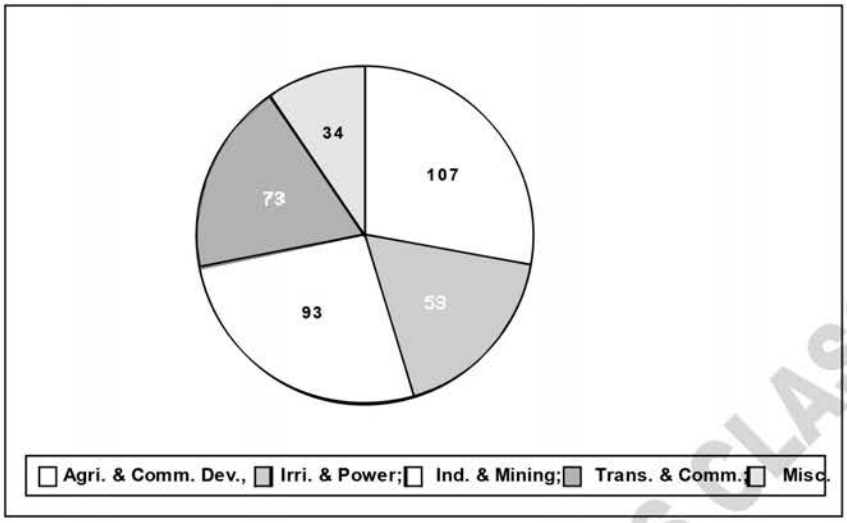
Represent the above information by a pie chart.

Solution: For drawing a pie chart the total expenditure is equated to 360° and then individual expenditure are converted into corresponding degrees which are calculated as:

Head of expenditure	***Expenditure (in crores of ₹)***	***Degrees***
Agriculture and community development	8,000	107
Irrigation and power	4,000	53
Industry and mining	7,000	93
Transport and communication	5,500	73
Miscellaneous	2,500	34
Total	**27,000**	**360**

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Pie chart is drawn according to the degrees.



GRAPHIC PRESENTATION OF FREQUENCY DISTRIBUTIONS

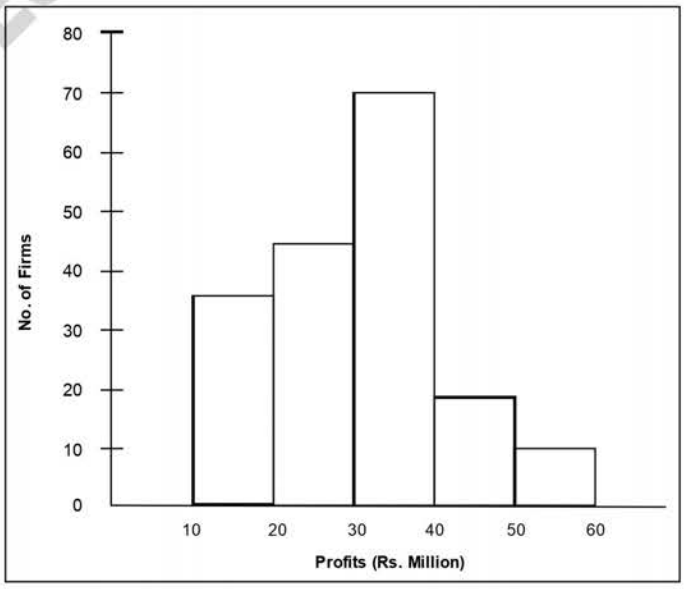
Frequency distribution can also be presented graphically. Histogram, frequency polygon, and ogive curves are used graphically show frequency distributions.

Histogram

Histogram is a graphic representation of a frequency distribution – continuous series. Each class is represented by a rectangle. The height of the rectangle on Y – axis (vertical – axis) shows the frequency of the class and while the class intervals are shown on X – axis (horizontal – axis). The number of rectangles in a histogram is equal to the number of classes of the frequency distribution. It is important to remember that histogram is not suitable for individual series

Example: Draw a histogram from the following data :

Profits (in ₹ Millions)	10-20	20-30	30-40	40-50	50-60
No. of firms	36	45	68	19	12



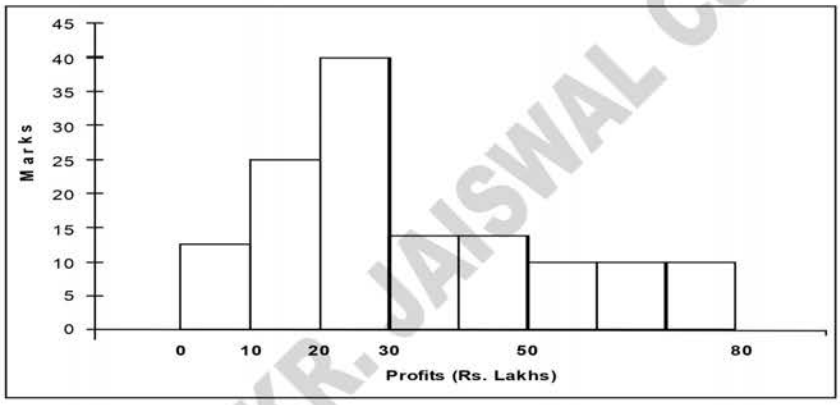
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The above procedure is slightly modified in case the width of class intervals is uncommon. If the class interval is higher than the usual interval, then the height of the rectangle is reduced and the width is increased proportionately. It can be explained by the following example.

Profits (₹ lakhs)	*No. of firms*
0-10	13
10-20	25
20-30	40
30-50	28
50-80	30

For the class 0-10, 10-20, and 20-30, the class interval is 10; the width of these classes will, therefore, be 10 and the height will depend upon the frequencies of the respective classes. But the interval of the class 30-50 is 20 which is double than usual class interval 10, therefore, its height will be reduced to 14 (28/2) but width wise it will move from 30 to 50, i.e., touching two widths, similarly the height of the class 50-80 is thrice than usual, hence, 3 will divide its frequency thus, the height of its rectangle will be 10 (30/3) but width will be between 50 to 80

Solution:



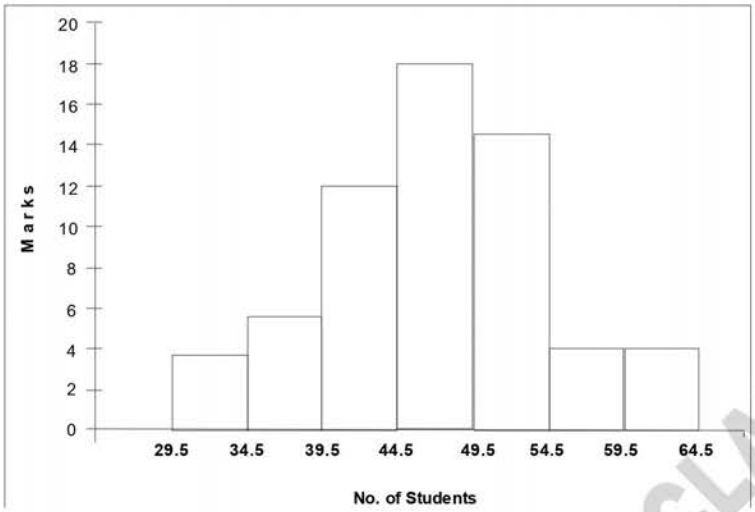
Example: The frequency distribution of marks obtained by 60 students of a class in a college is given below:

Marks	*No. of students*
30-34	3
35-39	5
40-44	12
45-49	18
50-54	14
55-64	8

Draw histogram for the distribution and find the modal value.

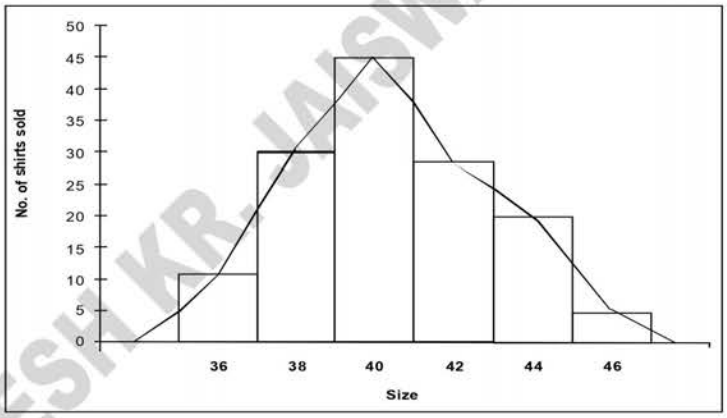
Solution: First of all this inclusive series be converted into exclusive series by subtracting 0.5 from all lower limits and adding 0.5 to all upper limits. Then divided the frequency of the last class by 2 as its class interval is double than other classes.

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FREQUENCY POLYGON

Frequency polygon is a curve drawn from a histogram. The midpoints of all the classes are plotted on the X-axis and above these midpoints dots for frequencies are marked on the Y – axis. Then all the frequency points are joined like a curve. The ends of the curve are extended in both sides so that they touch the midpoints of the imaginary classes on X-axis.



Ogive

Ogive is a graphic presentation of cumulative frequency distribution. For drawing an ogive, class intervals are shown on X – axis and cumulative frequency is plotted on Y – axis. Ogive are employed to show positional values such as median, quartiles, etc. Ogive can be drawn in two ways:

Less than ogive: To draw this type of ogive, we chose the upper limits of the classes; against the first upper limit we put a dot on Y – axis to show its frequency. For the second upper limit obtain the cumulative frequency by adding the first and the second – class frequencies and mark the cumulative frequency on the graph and repeat this step for all subsequent upper limits. All the points on the graph are joined. This gives a smooth rising curve.

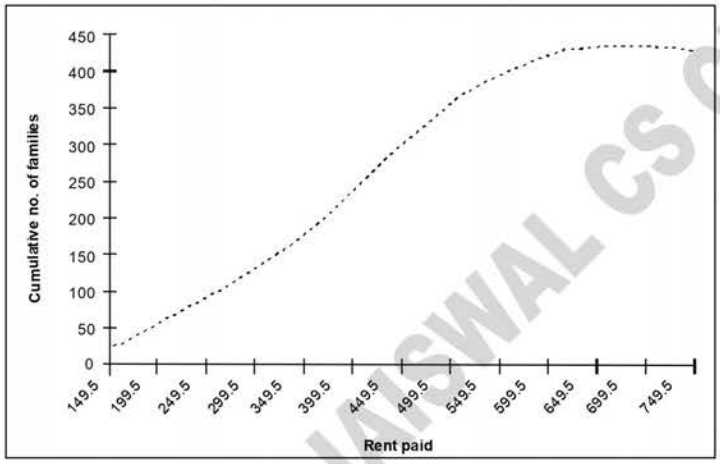
Example: From the following data of monthly house rent paid by certain number of families draw a less than ogive.

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Monthly house Rent paid (in ₹)	No. of Families	Monthly house Rent paid (in ₹)	No. of Families
100-149	20	450-499	40
150-199	27	500-549	35
200-249	36	550-599	25
250-299	47	600-649	17
300-349	49	650-699	14
350-399	44	700-749	3
400-449	43		

Solution:

First of all this inclusive series is converted into exclusive series then cumulative frequencies are obtained.



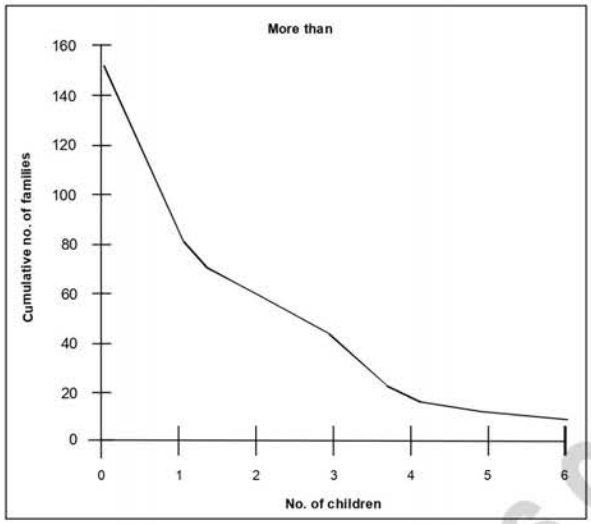
More than ogive: For a more than ogive chose lower limits of all class; for the first lower limit select the total frequency, for the next lower limit subtract the first frequency from the total frequency, repeat this procedure for all subsequent lower limits. Plot the frequencies on the graph; joint all the points and that gives a smooth falling curve.

Example: Draw a 'more than' ogive curve for the following data

No. of children	No. of families
More than 0	150
More than 1	72
More than 2	50
More than 3	28
More than 4	12
More than 5	8
More than 6	5

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Solution:



GRAPHS

Statistical information can also be shown through graphs. Profits of a firm, share price movement in the share market, oil reserves, gold price, etc., are frequently shown through graphs. Some of the frequently used graphs are explain here.

Line Graph

In line graph, first of all scales are fixed for X and Y – axis. X – axis represents time or independent variables and Y – axis shows dependent variables. Dependent variables are plotted through points on the graph paper and then these points are joined. The line/shape emerging from the joined points is known as line graph.

Since the line graph begins from zero value on Y – axis, therefore, in case of very high values the line graphs looks very shabby and disproportionate. In such cases we draw a false base line. A false base line is a set of two zigzag lines parallel to X-axis beginning from a convenient value on Y – axis leaving a gap for some values. A break in Y – axis is shown to represent values not mentioned in this axis. In the following example, the values begin from 130, therefore, on Y – axis we begin our scale from zero and then break it, create a false base. This false base may begin either from 100 or 130

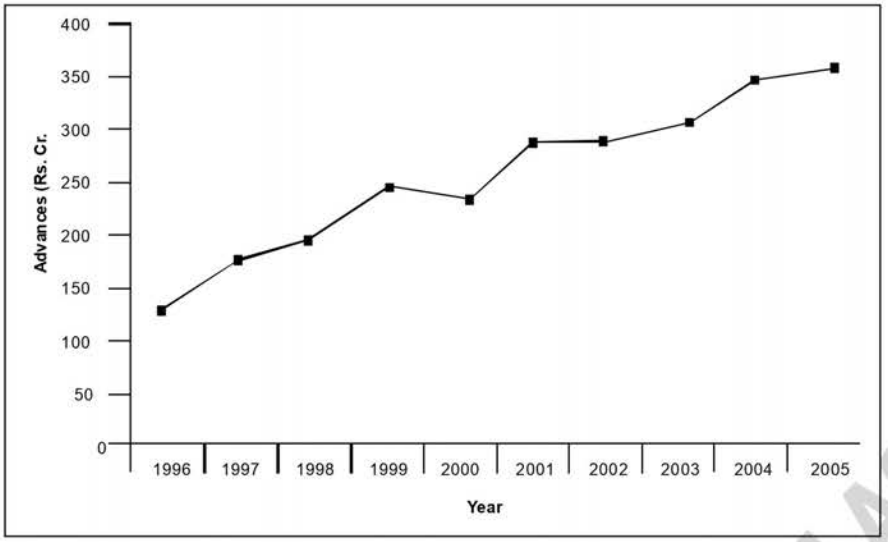
Example:

Closing balance of advances to big industries by a nationalized bank in different years is shown in the following table. Draw a line graph from these figures.

Years	1996	1997	1998	1999	2000	2001	2002	2003	2004	*2005*
Advances (in ₹ crores)	*130*	*160*	*190*	*240*	*240*	*290*	*300*	*310*	*350*	*370*

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Solution :

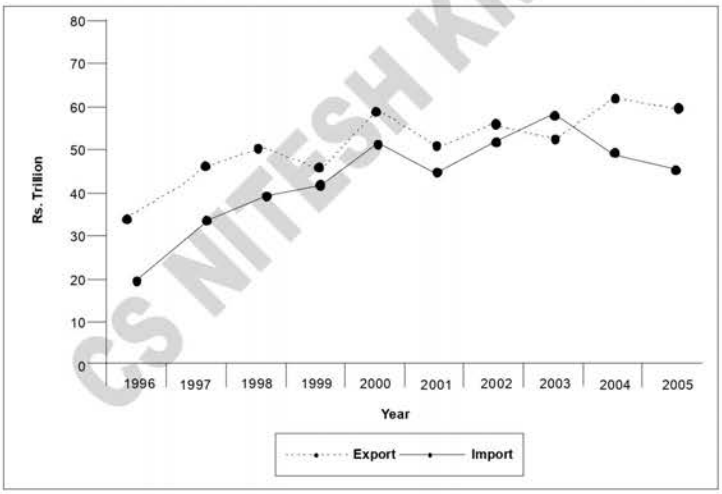


Two – lines graph or Balance graph

For one independent variable, sometimes there may be two independent variables. For these two independent variables, points are plotted on the graph and one line is drawn for one variable and the other line is drawn for the other variable. The area between these two lines represents the balance of the two variables. This type of graph is suitable to show profit (area), revenues and cost; balance of payment (area), exports and imports, etc.

Example: Export and import figures in trillions of rupees are mentioned below. Represent these figures through a two – lines graph.

Years	1996	1997	1998	1999	2000	2001	2002	2003	2004	*2005*
Exports	34	45	51	48	62	58	64	67	73	*70*
Imports	*20*	*34*	*41*	*45*	*56*	*52*	*60*	*70*	*62*	*60*



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OBJECTIVE QUESTIONS

1. If vertical lines are drawn at every point of straight line in frequency polygon then by this way frequency polygon is transformed into
   (a) width diagram
   (b) length diagram
   (c) histogram
   (d) dimensional bar charts

2. Diagrams such as cubes and cylinders are classified as
   (a) one dimension diagrams
   (b) two dimension diagram
   (c) three dimensional diagrams
   (d) dispersion diagrams

3. Discrete variables and continuous variables are two types of
   (a) open end classification
   (b) time series classification
   (c) qualitative classification
   (d) quantitative classification

4. Classification method in which upper limit of interval is same as of lower limit class interval is called
   (a) exclusive method
   (b) inclusive method
   (c) mid-point method
   (d) ratio method

5. Type of cumulative frequency distribution in which class intervals are added in top to bottom order is classified as
   (a) variation distribution
   (b) less than type distribution
   (c) more than type distribution
   (d) marginal distribution

6. Data based on workers salary is as 2500, 2700, 2600, 2800, 2200, 2100, 2000, 2900, 3000, 2800, 2200, 2500, 2700, 2800, 2600 and number of classes desired is 10 then width of class interval is
   (a) 400
   (b) 300
   (c) 100
   (d) 200

7. Largest value is 60 and smallest value is 40 and number of classes desired is 5 then class interval is
   (a) 20
   (b) 4
   (c) 25
   (d) 15

8. Summary and presentation of data in tabular form with several non-overlapping classes is referred as
   (a) nominal distribution
   (b) ordinal distribution
   (c) chronological distribution
   (d) frequency distribution

9. Classification method in which upper and lower limits of interval is also in class interval itself is called
   (a) exclusive method
   (b) inclusive method
   (c) mid-point method
   (d) ratio method

10. Diagrams used to represent grouped and ungrouped data is classified as
    (a) breadth diagrams
    (b) bar diagrams
    (c) width diagrams
    (d) length diagrams

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11. Considering types of diagrams, squares, circles and rectangles are classified as
(a) cumulative diagram
(b) dispersion diagrams
(c) one dimension diagrams
(d) two dimension diagram

12. Type of cumulative frequency distribution in which class intervals are added in bottom to top order is classified as
(a) more than type distribution
(b) marginal distribution
(c) variation distribution
(d) less than type distribution

13. 'less than type distribution' and 'more than type distribution' are types of
(a) class distribution
(b) cumulative class distribution
(c) cumulative frequency distribution
(d) upper limit distribution

14. Exclusive method and inclusive method are ways of classifying data on basis of
(a) manifold classes
(b) rational intervals
(c) class width
(d) class intervals

15. Histograms, pie charts and frequency polygons are all types of
(a) one dimension diagrams
(b) two dimension diagrams
(c) cumulative diagrams
(d) dispersion diagrams

16. Term used to describe frequency curve is
(a) symmetrical distribution
(b) symmetry and kurtosis
(c) kurtosis of distribution
(d) relative frequency curve

17. Third step in constructing frequency distribution is to
(a) select appropriate class intervals
(b) determine class intervals
(c) determine class limits
(d) determine midpoints of classes

18. Distribution which shows cumulative figure of all observations placed below upper limit of classes in distribution is considered as
(a) cumulative frequency distribution
(b) upper limit distribution
(c) class distribution
(d) cumulative class distribution

19. Data classification which is based on variables such as production, cost, height and weight is considered as
(a) qualitative classification
(b) quantitative classification
(c) open end classification
(d) time series classification

20. Three dimensional diagrams are named as so because they considers both
(a) length and breadth
(b) breadth and depth
(c) depth, length and breadth
(d) depth and length

21. Type of classification in which class is subdivided into subclasses and subclasses are divided into more classes is considered as
(a) simple classification
(b) manifold classification
(c) rational classification
(d) reflected classification

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22. Data table which is presented in tabular form on basis of two or more simultaneous characteristics is classified as
(a) percentage table
(b) interval table
(c) simple table
(d) complex table

23. Data table which is presented in tabular form on basis of single characteristics is classified as
(a) simple table
(b) complex table
(c) percentage table
(d) interval table

24. Area diagrams and surface diagrams are other names of
(a) single dimension diagrams
(b) two dimensional diagrams
(c) three dimensional diagrams
(d) four dimension diagrams

25. Frequency distribution which is result of cross classification is called
(a) bivariate frequency distribution
(b) univariate frequency distribution
(c) multi-variables distribution
(d) close ended distribution

26. Types of histograms includes
(a) deviation bar charts
(b) paired bar charts
(c) grouped charts
(d) all of above

27. Classification of data on geographical basis is also called
(a) reflected classification
(b) populated classification
(c) sampling classification
(d) spatial classification

28. Halfway point between lower class limits and upper class limits is classified as
(a) nominal mid-point
(b) class mid-point
(c) interval mid-point
(d) ordinal mid-point

29. Classification on basis of time order is called as
(a) disclosed classification
(b) chronological classification
(c) external classification
(d) internal classification

30. Graphs which represents data on maps are considered as
(a) cartograms
(b) picto-graph
(c) pictograms
(d) symmetry graph

31. Histograms and pie charts are classified as one dimensional diagrams because only
(a) length is considered
(b) width is considered
(c) length plus width is considered
(d) breadth is considered

32. If classification of collected data is based on characteristics such as religion, education and caste, then this is considered as
(a) open end classification
(b) time series classification
(c) qualitative classification
(d) quantitative classification

33. Process of arranging data on basis of certain properties in classes or groups is classified as
(a) classification of data
(b) reflection of data
(c) sample of population
(d) sample observations

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34. Smallest numerical value is subtracted from largest numerical value and then divided to number of class desired to calculate
(a) simple class interval
(b) width of class interval
(c) number of classes
(d) manifold class intervals

35. Type of graphical charts that allows user to make direct comparisons between various data sets are called
(a) multiple bar charts
(b) single bar charts
(c) paired charts
(d) non paired data charts

36. Type of table in which study variables provides large number of information with interrelated characteristics is classified as
(a) lower order table
(b) manifold table
(c) higher order table
(d) both b and c

37. First step in constructing frequency distribution is to
(a) select appropriate class intervals
(b) determine class intervals
(c) determine class limits
(d) determine midpoints of classes

38. Distribution which requires inclusion of open ended classes is considered as
(a) inclusive distribution
(b) midpoint distribution
(c) close ended distribution
(d) open ended distribution

39. Curve of cumulative frequency is also known as
(a) Ogive
(b) A-give
(c) C-give
(d) B-give

40. If midpoints of bars on charts are marked and marked dots are joined by a straight line then this graph is classified as
(a) class interval polygon
(b) paired polygon
(c) marked polygon
(d) frequency polygon

41. 'less than type' cumulative frequency distribution is considered as correspondent to
(a) upper limit of class intervals
(b) lower limit of class intervals
(c) upper limit of range
(d) lower limit of range

42. Sub-divided bar charts are considered best to be used if information is presented in
(a) negative values
(b) ratios or percentages
(c) mean deviations
(d) positive values

43. Graphical diagram in which total number of observations are represented in percentages rather than absolute values is classified as
(a) asymmetrical diagram
(b) ungrouped diagram
(c) grouped diagram
(d) pie diagram

44. Type of classification in which class is subdivided into subclasses and one attribute is assigned for statistical study is considered as
(a) rational classification
(b) reflected classification
(c) simple classification
(d) manifold classification

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45. Cumulative frequency distribution which is 'greater than' type is correspondent to
(a) upper limit of range
(b) lower limit of range
(c) upper limit of class intervals
(d) lower limit of class intervals

46. Simple classification and manifold classification are types of
(a) qualitative classification
(b) quantitative classification
(c) open end classification
(d) time series classification

47. Largest numerical value is 45 and smallest numerical value is 25 and classes desired are 4 then width of class interval is
(a) 45
(b) 65
(c) 5
(d) 17.5

48. Which of the following statements is false?
(a) Statistics is derived from the Latin word 'Status'
(b) Statistics is derived from the Italian word 'Statista'
(c) Statistics is derived from the French word 'Statistik'
(d) None of these

49. Statistics is defined in terms of numerical data in the
(a) Singular sense
(b) Plural sense
(c) Either (a) or (b)
(d) Both (a) and (b)

50. Statistics is applied in
(a) Economics
(b) Business management
(c) Commerce and industry
(d) Al these

51. Statistics is concerned with
(a) Qualitative information
(b) Quantitative information
(c) (a) or (b)
(d) Both (a) and (b)

52. An attribute is
(a) A qualitative characteristic
(b) A quantitative characteristic
(c) A measurable characteristic
(d) All these

53. Annual income of a person is
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) (b) or (c)

54. Marks of a student is an example of
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) None of these

55. Nationality of a student is
(a) An attribute
(b) A continuous variable
(c) A discrete variable
(d) (a) or (c)

56. Drinking habit of a person is
(a) An attribute
(b) A variable
(c) A discrete variable
(d) A continuous variable

57. Age of a person is
(a) An attribute
(b) A discrete variable
(c) A continuous variable
(d) A variable

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58. Data collected on religion from the census reports are
(a) Primary data
(b) Secondary data
(c) Sample data
(d) (a) or (b).

59. The data collected on the height of a group of students after recording their heights with a measuring tape are
(a) Primary data
(b) Secondary data
(c) Discrete data
(d) Continuous data.

60. The quickest method to collect primary data is
(a) Personal interview
(b) Indirect interview
(c) Telephone interview
(d) By observation.

61. The best method to collect *data,* in case of a natural calamity is
(a) Personal interview
(b) Indirect interview
(c) Questionnaire method
(d) Direct observation method.

62. In case of a rail accident, the appropriate method of data collection is by
(a) Personal interview
(b) Direct interview
(c) Indirect interview
(d) All these.

63. Which method of data collection covers the widest area?
(a) Telephone interview method
(b) Mailed questionnaire method
(c) Direct interview method
(d) All these.

64. The amount of non-responses is maximum in
(a) Mailed questionnaire method
(b) Interview method
(c) Observation method
(d) All these.

65. Some important sources of secondary data are
(a) International sources
(b) International and primary sources
(c) Private and primary sources
(e) Government sources.

66. The mode of presentation of data are
(a) Textual, tabulation and diagrammatic
(b) Tabular, internal and external
(c) Textual, tabular and internal
(d) Tabular, textual and external.

67. The best method of presentation of data is
(a) Textual
(b) Tabular
(c) Diagrammatic
(d) (b) and (c).

68. The most attractive method of data presentation is
(a) Tabular
(b) Textual
(c) Diagrammatic
(d) (a) or (b).

69. For tabulation, 'caption' is
(a) The upper part of the table
(b) The lower part of the table
(c) The main part of the table
(d) The upper part of a table that describes the column and sub-column.

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70. 'Stub' of a table is the
- **(a)** Left part of the table describing the columns
- **(b)** Right part of the table describing the columns
- **(c)** Right part of the table describing the rows
- **(d)** Left part of the table describing the rows.

71. The entire upper part of a table is known as
- **(a)** Caption
- **(b)** Stub
- **(c)** Box head
- **(d)** Body

72. The unit of measurement in tabulation is shown in
- **(a)** Box head
- **(b)** Body
- **(c)** Caption
- **(d)** Stub.

73. In tabulation source of the data, if any, is shown in the
- **(a)** Footnote
- **(b)** Body
- **(c)** Stub
- **(d)** Caption.

74. Which of the following statements is untrue for tabulation?
- **(a)** Statistical analysis of data requires tabulation
- **(b)** It facilitates comparison between rows and not columns
- **(c)** Complicated data can be presented
- **(d)** Diagrammatic representation of data requires tabulation.

75. Hidden trend, if any, in the data can be noticed in
- **(a)** Textual presentation
- **(b)** Tabulation
- **(c)** Diagrammatic representation
- **(d)** All these.

76. Diagrammatic representation of data is done by
- **(a)** Diagrams
- **(b)** Charts
- **(c)** Pictures
- **(d)** All these.

77. The most accurate mode of data presentation is
- **(a)** Diagrammatic method
- **(b)** Tabulation
- **(c)** Textual presentation
- **(d)** None of these.

78. Pie-diagram is used for
- **(a)** Comparing different components and their relation to the total
- **(b)** Representing qualitative data in a circle
- **(c)** Representing quantitative data in circle
- **(d)** or (c).

79. A frequency distribution
- **(a)** Arranges observations n an increasing order
- **(b)** Arranges observation in terms of a number of groups
- **(c)** Relates to a measurable characteristic
- **(d)** All these

80. The frequency distribution of a continuous variable is known as
- **(a)** Grouped frequency distribution
- **(b)** Simple frequency distribution
- **(c)** or (b)
- **(d)** and (b).

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81. The distribution of shares is an example of the frequency distribution of
- **(a)** A discrete variable
- **(b)** A continuous variable
- **(c)** An attribute
- **(d)** (a) or (c).

82. Mutually exclusive classification
- **(a)** Excludes both the class limits
- **(b)** Excludes the upper class limit but includes the lower class limit
- **(c)** Includes the upper class limit but excludes the upper class limit
- **(d)** Either (b) or (c).

83. Mode of a distribution can be obtained from
- **(a)** Histogram
- **(b)** Less than type Ogives
- **(c)** More than type Ogives
- **(d)** Frequency polygon.

84. Median of a distribution can be obtained from
- **(a)** Frequency polygon
- **(b)** Histogram
- **(c)** Less than type ogives
- **(d)** None of these.

85. A comparison among the class frequencies is possible only in
- **(a)** Frequency polygon
- **(b)** Histogram
- **(c)** Ogives
- **(d)** (a) or (b).

86. Frequency curve is a limiting form of
- **(a)** Frequency polygon
- **(b)** Histogram
- **(c)** (a) or (b)
- **(d)** (a) and (b)

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ANSWER

1	(c)	**2**	(c)	**3**	(d)	**4**		**5**	(b)	**6**	(c)	**7**	(b)
8	(d)	**9**	(b)	**10**	(b)	**11**	(d)	**12**	(a)	**13**	(c)	**14**	(d)
15	(a)	**16**	(b)	**17**	(c)	**18**	(a)	**19**	(b)	**20**	(c)	**21**	(b)
22	(d)	**23**	(a)	**24**	(b)	**25**	(a)	**26**	(d)	**27**	(d)	**28**	(b)
29	(b)	**30**	(a)	**31**	(a)	**32**	(c)	**33**	(a)	**34**	(b)	**35**	(a)
36		**37**	(a)	**38**	(d)	**39**	(a)	**40**	(d)	**41**	(a)	**42**	(b)
43	(d)	**44**	(c)	**45**	(d)	**46**	(a)	**47**	(c)	**48**	(c)	**49**	(a)
50	(d)	**51**	(d)	**52**	(a)	**53**	(c)	**54**		**55**	(a)	**56**	(a)
57	(b)	**58**	(a)	**59**	(d)	**60**	(c)	**61**	(a)	**62**	(a)	**63**	(b)
64	(a)	**65**	(d)	**66**	(a)	**67**	(c)	**68**	(c)	**69**	(d)	**70**	(a)
71	(c)	**72**	(d)	**73**	(a)	**74**	(b)	**75**	(a)	**76**	(d)	**77**	(a)
78	(d)	**79**	(d)	**80**	(a)	**81**	(b)	**82**	(d)	**83**	(a)	**84**	(c)
85	(d)	**86**	(d)										

CHAPTER 8 CENTRAL TENDENCY, DISPERSION AND CORRELATION

Statistical average:

A single expression, representing the whole group or population, is selected which may convey a fairly adequate idea about the whole group. The single expression in statistics is known as the average.

Averages are the typical values around which other items of the distribution congregate. They are the values which lie between the two extreme observations, (i.e. the smallest and the largest observations), or the distribution and give us an idea about the concentration of the values in the central part of the distribution. Accordingly they are also sometimes referred to as the Measures of Central Tendency. Average is very much useful,

(i) For describing the distribution in concise manner.

(ii) For comparative study of different distributions.

(iii) For computing various other statistical measures such as dispersion, skewness, kurtosis and various other basic characteristics of mass of data.

Remark: Averages are also sometimes referred to as **Measures of Location** since they enable us to locate the position or place of the distribution in question.

A good average must have the following characteristics

(i) It should be rigidly defined so that different Persons may not explain it differently.
(ii) It should be easy to understand and easy to calculate.
(iii) It should be at based on all the observation of the data.
(iv) It should be easily subjected to further mathematical calculations
(v) It should be least affected by the fluctuations of the sampling.
(vi) It should not be unduly affected by the extreme values.
(vii) It should be easy to interpret.
(viii) It should have sampling stability

Calculation of Arithmetic Mean:

Individual Observations:

the arithmetic mean (A.M.) of a set of n observations $X_1, X_2, \ldots\ldots, X_n$ (not necessarily all distinct), denoted by $\overline{X}$, is given by

$$\overline{X} = \frac{X_1+X_2+\cdots+X_n}{n} = \frac{\sum X}{n}$$

Short-cut-method: It may be pointed out that if the values of X are very large, the computation of arithmetic mean can be done by using what is known as short-cut method. The various steps involved in the computation of arithmetic mean by short-cut method are as follows:

Step 1. Choose as arbitrary number A, called an assumed mean. Any number can be chosen as an assumed mean. However, it is usually taken as the values of X which corresponds to the middle part of the distribution. Moreover, a need not necessarily be one of the values of X.

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Step 2. Compute d= X-A, deviation of X from A.

Step 3. The arithmetic mean is given by

$$\bar{X} = A + \frac{\sum d}{n}.$$

Discrete Series:

In case of discrete series where the variable X takes the values X_1, X_2, ..., X_n which respective frequencies f_1, f_2, ..., f_n, the arithmetic mean can be calculated by applying

(i) Direct method, or

(ii) Short –cut method

Direct Method: According to this method, the A.M. is given by

$$\bar{X} = \frac{f_1X_1+f_2X_2+\cdots+f_nX_n}{f_1+f_2+\cdots+f_n} = \frac{\sum fX}{\sum f} = \frac{\sum fX}{N}$$

Where $N = \sum f$ = total frequency.

Short-cut method: According to this method arithmetic mean is given by

$$\bar{X} = A + \frac{\sum fd}{N}.$$

Where A = assumed mean, d=X-A and $N = \sum f$.

Continuous Series:

In case of continuous series, the arithmetic mean may be computed by applying any of the following methods:

(i) Direct method.

(ii) Short-cut method,

(iii) Step-deviation method.

Direct Method: If X_1, X_2, ..., X_n are the class marks (or mid-values) of a set of grouped data with corresponding class frequencies f_1, f_2, ..., f_n, then according to the direct method, arithmetic mean is given by

$$\bar{X} = \frac{f_1X_1+f_2X_2+\cdots+f_nX_n}{f_1+f_2+\cdots+f_n} = \frac{\sum fX}{\sum f} = \frac{\sum fX}{N}$$

Where $N = \sum f$ is the total frequency.

Short-cut Method: According to this method, arithmetic mean is given by

$$\bar{X} = A + \frac{\sum fd}{N}$$

Where A = assumed mean, d=X-A, deviation of mid-value from assumed mean and

$N = \sum f$ = total frequency.

Step-deviation Method: In case of grouped or continuous frequency distribution with class intervals of equal size, the calculation of arithmetic mean can further be simplified by taking

$$U = \frac{X-A}{h}$$

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Where X is the mid-value and h is the common size (or width) of the class intervals. According to this method, the arithmetic mean is given by

$$\overline{X} = A + \frac{\sum f\ u}{N} \times h$$

COMBINED MEAN

If the arithmetic means of two or more sets of data are known, then we can also obtain the arithmetic mean of the combined data. For example, if n_1, and n_2 are the number of observations and $\overline{X_1}$, $\overline{X_2}$ are the respective means of two sets of data, then the mean, $\bar{X}$ or $\overline{X_2}$ are the respective means of two sets of data, then the mean, $\bar{X}$ or $\overline{X_{12}}$, of the combined data with $n_1 + n_1$ observations is give by

$$\bar{X} = \overline{X_{12}} = \frac{n_1\overline{X_1}+n_2\overline{X_2}}{n_1+n_1}$$

The result can be generalized to more than two sets of data. For example if $\overline{X_1}$, $\overline{X_2}$, ..., $\overline{X_k}$ be the mean of different sets of data and n_1, n_2 , ..., n_k be the number of observations in each set, then the arithmetic mean of the combined data with $n_1 + n_2 +$.....+ n_k observations is given by

$$\bar{X} = \bar{X}_{1,2,\ldots,k} = \frac{n_1\overline{X_1}+n_2\overline{X_2}+\cdots.n_k\overline{X_k}}{n_1+n_1+\cdots\ldots+n_k}$$

Properties of Arithmetic Mean:

1. Algebraic sum of the deviations of the given values from their arithmetic mean is always zero, i.e. $\sum(X_i-\overline{X}) =0$.
2. The sum of squares of the deviations of the given values from their A.M. is minimum, i.e. $\sum(X_i - \overline{X})^2$ is minimum. In other words, we can say$\sum(X - A)^2$, the sum of the squares of deviations of a given set of observations from an arbitrary value A is minimum when A = $\bar{X}$.
3. If each observations of a data is increased or decreased by a constant k, then the arithmetic mean of the new data also gets increased or decreased by k, that is if Y = X+k, then $\bar{Y} = \bar{X}$ + k.
4. If each observations of a data is multiplied by a constant k, then the arithmetic mean of the data so obtained also gets multiplied by it.

Correcting Incorrect Mean

To find corrected mean whenever one, two or more of the observations were wrongly copied down. For example, suppose we have computed the mean $\bar{X}$ of n observations and later on it is found that two observations, say, X_1 and the X_2, were wrongly copied down as X'_1 and X'_2. It is now required to compute the corrected mean by replacing the wrong observations by the correct ones, we can first obtain the uncorrected sum of the observations X'_1 and X'_2 and add the corresponding correcting observations X_1 and X_2 to get the corrected sum equal to

$$n\bar{X} - (X'_1 + X'_2) + (X_1 + X_2)$$

Dividing this by n, we get the corrected mean.

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In general, if observations are misread X'_1 , X'_2..... X'_r while correct observations are X_1, X_2, ... X_r then the correction of sum of observations is given by

$n\bar{X}$ - (X'_1 + X'_2 +.....+ X'_r)+ (X_1 + X_2 + ...+X_r

MERITS AND DEMERITS OF ARITHMETIC MEAN:

Merits:

Arithmetic mean possesses the following merits:

1. It is rigidly defined.
2. It is easy to calculate and simple to understand.
3. It is based on all the observations.
4. It is suitable for further mathematical treatment.
5. Of all the averages, arithmetic mean is affected least by fluctuations of sampling.

Demerits:

Arithmetic mean has the following drawbacks:

1. It is very much affected by extreme values.
2. In a distribution with open-end classes the value of mean cannot be computed without making assumptions regarding the size of the class interval of the open-end classes.
3. It can neither be determined by inspection nor can it be located graphically.
4. It cannot be computed for a qualitative data such as honesty, beauty, intelligence etc.
5. It may lead to wrong conclusions if the details of the data from which it is obtained are not available.

MEDIAN:

Median is another measure of central tendency. As distinct from the arithmetic mean, which is based on all the items of the distribution, the median is what is called a positional average. The term 'position' refers to the place of a value in the distribution. The position of the median in a distribution is such that the number of observations above it is equal to the number of observations below it.

Definition: -

The median of a set of observations arranged in an ascending or descending order of magnitude is defined as the middle value or the arithmetic mean of two middle values according as the number of observations is odd or even respectively. Thus median of a distribution is that value of the variable which exceeds and is exceeded by the same number of observations.

Calculation of Median:

Individual Observations:

For ungrouped data consisting of n observations, the calculation of median involves the following steps:

Step 1. Arrange the given set of observations in an calculation of median involves the magnitude.

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Step 2. The median is given by

1. The value of $\left(\frac{n+1}{2}\right)$ th observation, when n is odd
2. The arithmetic mean of the values of $\left(\frac{n}{2}\right)$th and $\left(\frac{n}{2}+1\right)$ th observations, when n is even.

Discrete Series:

In the case of discrete series, where the variable takes the values X_1, X_2, ..., X_n with respective frequencies f_1, f_2, ... f_n with $\sum f$ = N, median in the size of $\left(\frac{n+1}{2}\right)$th observations.

In this case, the calculation of median involves the following steps:

Step 1. Prepare the 'less than' cumulative frequency (c.f.) distribution.

Step 2. Find $\frac{N+1}{2}$

Step 3. See the c.f. just greater than or equal to $\frac{N+1}{2}$.

Step 4. The value of the variable corresponding to the c.f. obtained in Step 3.

This is the required median.

Continuous Series:

In case of continuous series, the Median may be computed by applying the following interpolation formula:

$$\text{Median} = L + \frac{\frac{N}{2} - C}{f} \times h.$$

Where , L = lower limit of the median class,

F = frequency of the median class,

C = cumulative frequency of the class preceding the median class, and

h = size or width of the median class.

The Median Class is the size of N/2 th item of the series.

REMARKS:

(i) Calculation of Median when Class Intervals are Unequal:

It may be remarked that even if class intervals are unequal in size, the frequencies need not be adjusted to make the class intervals equal and the same interpolation formula can be applied for calculating median as discussed before.

(ii) Calculation of Median mid-values of class intervals are given:

When the mid-values of class intervals are given, the class intervals can be obtained by first finding out the difference between two mid-values and then subtracting half of it from each mid-value of find the lower limit and adding it to each mid-value to find the upper limit of the class intervals.

(iii) Calculation of Median in Cumulative Series:

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If the data is given in the form of a cumulative frequency distribution, it has to be first arranged in an ordinary frequency distribution in order to find out the frequency of the median class which is needed in the calculation of median. Once it is done, the rest of the procedure is same as in any other continuous series.

MERITS AND DEMERITS OF MEDIAN

Merits:

Median possesses the following merits;

1. It is rigidly defined.
2. It is easy to calculate and simple to understand.
3. It can be computed while dealing with a distribution with open end classes.
4. Being a positional average, it is not much affected by extreme observations. For example, the median of 10, 15, 20, 25, and 130 is 20 whereas the mean is 40. Hence very often when extreme values are present in a set of observation, the median is more satisfactory measure of central tendency than the mean.
5. It is the most appropriate average to be used while dealing with qualitative data.
6. It can sometimes be located by inspection and can also be determined graphically.

Demerits:

Median has the following limitations:

1. Median, being a positional average, is not based on each and every item of the distribution.
2. It is not suitable for further mathematical treatment. For example, it is not possible to find the combined median of two or more groups.
3. It cannot be determined exactly for an ungrouped data consisting of an even number of observation. It is determined approximately as the mid-point of two middle observations.
4. In comparison to arithmetic mean, it is much affected by sampling fluctuations.
5. For calculating median, it is necessary to average the data in order of magnitude.

Mathematical Property of Median:

1. The sum of the deviations of a given set of observations taken from median, ignoring ± signs, is the least.
2. The median is affected by change of origin and scale.

MODE:

The mode of a set of observations is that value which appears most frequently or with the greatest frequency. If two or more values appear with the same greatest frequency, each is a mode. If no value is repeated, there is no mode.

Calculation of Mode

Ungrouped Data:

For determining mode in the case of ungrouped data, count the number of times the various values repeat themselves and the value occurring the maximum number of times in the mode.

For example, the mode of the set of numbers

3 4 4 5 6 7 7 7 9

is 7, since it appears three times and no other value appears more than twice.

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Discrete Series:

In discrete frequency distribution, mode can be determined just by inspection. It is the value of the variable corresponding to the maximum frequency. However, this method is applicable only if the distribution is unimodal. If it has only one mode. For example, consider the following distribution:

X	:	1	2	3	4	5	6	7
f	:	1	4	12	7	2	3	1

Since the value of X corresponding to the maximum frequency is 3, the mode is 3

Continuous Series:

In the case of continuous frequency distribution, the first step is to ascertain the modal class, i.e. the class corresponding to the maximum frequency. This can be done either by inspection or by preparing the grouping table and analysis table. The value of mode is then obtained by applying the following interpolation formula:

$$\text{Mode} = L + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times h$$

Where, L = lower limit of the modal class.

f_m = frequency of the modal class.

f_1 = frequency of the class preceding the modal class,

f_2 = frequency of the class succeeding the modal class,

h = size of the modal class.

The above formula for calculating mode can also be put in a different form as follows:

$$\text{Mode} = l + \frac{\Delta_1}{\Delta_1 + \Delta_2} \times h$$

Where, $\Delta_1 = f_m - f_1$ = frequency of the modal class- frequency of the class preceding the modal class

$\Delta_2 = f_m - f_2$ = frequency of the modal class- frequency of the class succeeding the modal class

REMARKS: It may remark that the above formula for computing mode is based on the following assumptions:

(i) The frequency distribution must be continuous with exclusive type classes without any gaps. If the data are not given in the form of continuous classes, it must first be converted into continuous classes before applying the above formula.

(ii) The class intervals must be uniform throughout, i.e., the size of all the class intervals must be same. If they are unequal they should first be made equal on the assumption that frequencies are uniformly distributed over all the classes

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Mode when class intervals are unequal:

The formula for calculating the value of mode given above is applicable only where there are equal class intervals. If the class intervals are unequal, then we must make them equal before we start computing the value of mode. The class interval should be made equal and frequencies adjusted on the assumption that they are equally distributed throughout the class.

EMPIRICAL RELATIONSHIP AMONG MEAN, MEDIAN AND MODE:

For a symmetrical distribution, the mean, mode and median all coincide. However, for a moderately skewed or asymmetrical distribution, the mean tends to lie on the same side of the mode as the longer side and the median lies in between them and they obey the following Empirical relation, given by Prof. Karl Pearson.

Mean – Mode = 3 (Mean – Median)

Mode = 3 Median – 2 Mean

MERITS AND DEMERITS OF MODE:

Merits:

Mode possesses the following merits:

1. It is simple to understand and easy to calculate.
2. It can be determined graphically from a histogram.
3. It is not at all affected by extreme observations and can be calculated even if extreme values are not known.
4. It can be conveniently determined for distribution with open and classes.

Demerits:

Mode has the following drawbacks:

1. It is not rigidly defined.
2. It is not based on all the observations.
3. It is not suitable for further mathematical treatment.
4. The value of mode cannot always be determined. In some cases, we may have a bimodal distribution.

The comparison among Mean, Median & Mode:

Mean	Median	Mode
1. It is calculated average	1. It is positional average	1. It is positional average
2. It is based on all the observation	2. It is the middle value which divides the series in to two equal parts	2. It is the value around which the items concern to a density.
3. It is capable of mathematical treatment.	3. It is not capable of mathematical treatment	3. It is not capable of mathematical treatment.
4. It is affected by extreme and abnormal values.	4. It is not affected by the extreme value	4. It is not affected by the extreme value.
5. There is only one mean		

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6. Most reliable measure. 7. It is simple and widely used in statistical treatment & interpretation.	5. There is only one median. 6. Less reliable and is used only in appropriate cases.	5. In a series there may be one mode or more than one mode or no mode. 6. Less reliable & not popular.

Measures of Dispersion

- Dispersion is the measure of the variations of the items. - A.L. Bowley
- Dispersion is the measure of the extent to which the individual items vary. -L.R.Connor
- The degree to which numerical data tend to spread about an average value is called the variation or dispersion of the data.- Spiegel
- Dispersion or spread is the degree of the scatter or variation of the variables about a central value.
- The term dispersion is used to indicate the facts that within a given group, the items differ from one another in size or in other words, there is a lack of uniformity in their sizes.

It is clear from these definitions that dispersion (also called scatter, spreads or variation) measures the extent to which the individual items vary from a Central Value.

MEASRUES OF DISPERSION:

The degree to which numerical data tend to spread about an average value is called the variation or dispersion of the data. The measures of dispersion can be classified as follows:

(i) Absolute measures of dispersion.
(ii) Relative measures of dispersion.

Absolute Measures of Dispersion:-

The measures of dispersion which are expressed in the same statistical unit in which the original data are given are termed as absolute measures of dispersion. They have a serious drawback because dispersion obtained from these measures cannot be used to compare the variability of two distributions expressed in different units.

Following are the absolute measures of dispersion,

(i) Range
(ii) Quartile deviation
(iii) Mean deviation
(iv) Standard deviation

Relative Measures of Dispersion:-

These measures are pure numbers independent of the units of measurement and can be used to compare the variability of two distributions expressed in different units.

Following are the relative measures of dispersion,

(i) Coefficient of Range
(ii) Coefficient of Quartile deviation
(iii) Coefficient of Mean deviation
(iv) Coefficient of variation

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REMARKS: For compare the variability of two distributions, we compute the relative measures of dispersion instead of absolute measures.

PROPERTIES OF A GOOD MEASURE OF DISPERSION:

A good measure of dispersion should possess the following properties:

1. It should be simple to understand.
2. It should be easy to calculate.
3. It should be rigidly defined.
4. It should be based on all the observations.
5. It should be amenable to further mathematical treatment.
6. It should have sampling stability.
7. It should not be unduly affected by extreme observations.

RANGE

It is that form of absolute dispersion where the difference between the maximum and the minimum values are taken. For example the range of temperature.

Range = Maximum value – minimum value

Coefficient of Range

It is that form of relative dispersion where the proportionate change in range is taken.

Coefficient of range = (maximum – minimum)/ (maximum +minimum)

Mean Absolute deviation

STANDARD DEVIATION:

The concept of standard deviation was first introduced by Karl Pearson in 1893. It is by far the most important and widely used measure of studying dispersion.

The standard deviation, abbreviated as S.D., of a given set of observation is defined as the positive square root of the arithmetic mean of the squares of deviations of the observations from their arithmetic mean. It is denoted by the Greek small letter σ (read as sigma).

Methods of calculating standard Deviation- [Ungrouped Data]:

By definition the standard deviation of a ungrouped data consisting of n observations $X_1, X_2, \ldots\ldots X_n$ is given by,

$$\sigma = \sqrt{\frac{\sum(X-\bar{X})^2}{n}} \quad \text{where} \quad \bar{X} = \frac{\sum X}{n}$$

The computation of standard deviation by definition is very effective, if $\bar{X}$ is an integer. However, if $\bar{X}$ comes out to be in fraction, its computation becomes very cumbersome and time-consuming. In that case we apply the following method which is very effective and reduces the numerical calculations to a great extent.

Direct Method:

According to this method, standard deviation is given by

$$\sigma = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = \sqrt{\frac{\sum X^2}{n} - \bar{X}^2}$$

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Again if the values of X are large, this formula can further be simplified by using assumed mean method. When this method is used we take deviation of each item form an assumed mean, say A.

Assumed Mean Method (Short Cut Method):

According to this method, standard deviation is given by

$$\sigma = \sqrt{\frac{\sum d^2}{n} - \left(\frac{\sum d}{n}\right)^2}, \text{ where } d = X - A$$

Finally, if c is the common factor of the given data, then we may apply the following method, called step-deviation method.

Step- deviation Method:

According to this method, standard deviation is given by

$$\sigma = \sqrt{\frac{\sum U^2}{n} - \left(\frac{\sum U}{n}\right)^2} \times c,$$

Where $u = \frac{X-A}{c}$ and c = common factor.

An important Result:

$$\sigma^2 = \frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2$$

$$\sigma^2 = \frac{\sum X^2}{n} - \bar{X}^2$$

$$\frac{1}{n}\sum X^2 = \sigma^2 + \bar{X}^2$$

$$\sum X^2 = n\,(\sigma^2 + \bar{X}^2)$$

The above result is quite useful to find the correct value of standard deviation whenever one or more of the observations are wrongly copied down.

REMARKS: Standard deviation of a distribution is independent of change of origin but not of scale.

Variance:

The variance of a given set of observations is defined as the square of its standard deviation and is denoted by σ^2. Thus

$$\sigma^2 = \frac{\sum (X-\bar{X})^2}{n} \quad \text{or} \quad \sigma^2 = \frac{\sum f(X-\bar{X})^2}{N}$$

COEFFICIENT OF VARIATION:

The standard deviation is an absolute measure of dispersion, depending upon the units of measurement. It does not tell use much about the variability of a single set of data. The coefficient of standard deviation, based on standard deviation, is a relative measure of dispersion and is given by,

Coefficient of Standard Deviation = S.D./Mean

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This is a pure number independent of the units of measurement and hence can be used to compare the variability of two distributions expressed in different units. Perhaps a more appropriate measure is the coefficient of variation (C.V.), defined by

$$\textbf{Coefficient of Variation} = \frac{S.D.}{Mean} \times 100 = \frac{\sigma}{\bar{X}} \times 100$$

This expresses the standard deviation as a percentage of the mean. Since, C.V. is a measure of relative variation expressed as a percent, the coefficient of variation can be used to compare the variability of two or more sets of data even when the observations are expressed in different units of measurement.

A distribution for which the coefficient of variation is smaller is said to be less variable or more consistent, more uniform, more stable or more homogeneous. On the other hand, the distribution for which the coefficient of variation is greater is said to be more variable or less consistent, less uniform, less stable or less homogeneous.

MERITS AND DEMERITS OF STANDARD DEVIATION:

Merits:

1. It is rigidly defined and is based on all the observations.
2. It is suitable for further mathematical treatment.
3. It is least affected by fluctuations of sampling.
4. It find wide applications in further statistical work, such as skewness, kurtosis, correlation and regression analysis, sampling theory land tests of significance etc.

Demerits:

1. It is difficult to compute.
2. It gives more weightage to extreme observations.
3. Standard deviation, being an absolute measure of dispersion, cannot be used to compare two distributions expressed in different units.

Quartile

Just as Median divides the observation into two equal parts similarly the Quartiles devide the onservation into four equal parts. There are three quartiles :

a) **First quartile Q_1**
b) **Second Quartile Q_2**
c) **Third quartile Q_3**

Calculation

a) First quartile is the value corresponding to $N/4^{th}$ observation
b) Second quartile or Median is the value corresponding to N/2th observation
c) Third Quartile is the value corresponding to 3N/4 th observation.

Quartile Deviation

It is a relative for of dispersion.

The formula is :$(Q_3 - Q_1)/ (Q_3+Q_1)$

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Correlation coefficient

The word correlation is used to denote the degree of association between variables. If two variables are associated in such a manner that a change in one variable will lead to change in other variable, they are said to be correlated. If y tends to increase if x increases, then they are **positively correlated**. If increase in y decreases the value if x then they area **negatively correlated.**

Correlation may **be linear or non linear**. If the amount of change in one variable tend to bear a constant ratio to the amount of change in other variable then the correlation will be linear because the scatter diagram will show a linear path. Here we are concerned with linear correlation only for which we need to calculate **correlation coefficient**. It is denoted by " r "

The formula is :

$$r=\{n\sum xy-(\sum x)(\sum y)\}/\sqrt{[\{n\sum x^2-(\sum x)^2\}]\sqrt{[\{n\sum y^2-(\sum y))^2\}]}$$

correlation coefficient lies between -1 and +1

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OBJECTIVE QUESTIONS

1. The mean of 70 numbers is 20 ,if each number is divided by 8 then the new mean is
(a) 3
(b) 3.5
(c) 2.5
(d) 2

2. The mean weight of 200 students is 55 kg. the mean of boys is 65 and that of girls is 50,find the number of boys and girls
(a) 134,66
(b) 100,100
(c) 120,80
(d) None

3. The algebraic sum of deviation of 8,1,6 from A.M say 5 is
(a) 0
(b) 1
(c) -1
(d) None

4. If a variable assumes values 1,2,3,4,5 with frequencies 2,4,6,8,10 then A.M is
(a) 11/3
(b) 5
(c) 4
(d) 6

5. Mode = 18 , mean=24 then the median is
(a) 21
(b) 24
(c) 22
(d) 18

6. Find the median of the following

6,10,4,3,9,11,22,18
(a) 9
(b) 10
(c) 9.5
(d) 10.5

7. Find the median of the following

X	5	7	9	12	14	17	19	21
f	6	5	3	6	5	3	2	4

(a) 6
(b) 7
(c) 10.5
(d) 9

8. Mode of 40,50,30,20,25,35,30,30,20,30 is
(a) 35
(b) 20
(c) 30
(d) None

9. The quartile deviation of the following data is

12,7,15,10,16,17,25
(a) 4.5
(b) 3.5
(c) 9
(d) None

10. The variance of 2,4,6,8,10 is
(a) 8
(b) $8^{1/2}$
(c) 6
(d) None

11. The coefficient of the range from the following is

45,20,15,65,73,84,53,35,71,55
(a) .696
(b) .69
(c) 686
(d) .586

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12. The coefficient of a series is 58 . its standard deviation is 21.2 . its arithmetic mean is

(a) 36.6
(b) 22.6
(c) 26.6
(d) 36.1

13. If the following information is provided then find the standard deviation

$\sum x = 235$, $\sum x^2 = 6750$, $n = 20$

(a) 12
(b) 16
(c) 14
(d) 18

14. The variance of a,b,c is 9 then variance of 5a,5b,5c is

(a) 45
(b) 9/5
(c) 5/9
(d) 225

15. The standard deviation of the series is

22,26,28,20,24,30

(a) 2
(b) 2.4
(c) 3
(d) 3.42

16. The mean and standard deviation of a series of 10 values was 10,2 respectively. It was later found that a number was actually 12 but it was taken as 8 . so find the correct mean and standard deviation

(a) 10.4,1.95
(b) 12,2
(c) 18,3
(d) None

17. Compute the quartile deviation from the following

Class	Frequency
10-15	4
15-20	12
20-25	16
25-30	22
30-35	10
35-40	8
40-45	6
45-50	12

(a) 8
(b) 7.5
(c) 7
(d) 7.9

18. The weights of 11 men were 148,154,158,160,161,162,166,170,182,195,236. If the heaviest man is omitted then find the percentage change in the range.

(a) 50%
(b) 44%
(c) 305
(d) 47%

19. Find the coefficient of correlation from the following data

X	65	63	67	64	68	62	70	66
Y	68	66	68	65	69	66	68	65

(a) .7
(b) 1.6
(c) .77
(d) .64

20. Calculate the correlation coefficient

X	6	2	10	4	8
Y	9	11	5	8	7

(a) -.92
(b) .5
(c) -.45
(d) 1

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21. Given $\sum x=30$,$\sum y=5$, $\sum x^2=670$, $\sum y^2=285$, $\sum xy=334$ n=12, Find correlation coefficient
(a) .9
(b) .8
(c) .7
(d) .78

22. A measure of central tendency tries to estimate
(a) Upper value
(b) lower value
(c) central value
(d) none

23. Which of the following is incorrect
(a) Median can calculate the central value of qualitative data
(b) Mode can be algebraically treated
(c) Mean is affected by extreme values
(d) All of the above

24. --------is called positional average
(a) Mean
(b) Median
(c) Mode
(d) all

25. For an even number of values the median is the
(a) Middle value
(b) average of the two middle values
(c) both a and b
(d) none

26. If a series of observations has more than one mode then the mode is
(a) Unimodal series
(b) bimodal series
(c) trimodal series
(d) none

27. When all observations occur with equal frequency there is
(a) Mean
(b) median
(c) mode
(d) all

28. The variance is ------ of standard deviation
(a) Sum
(b) square
(c) square root
(d) difference

29. Standard deviation is ..... Measure of dispersion
(a) Absolute
(b) relative
(c) weighted
(d) assumed

30. Histogram can measure
(a) Mean
(b) median
(c) mode
(d) none

31. For determination of mode the class intervals should be
(a) Maximum
(b) Minimum
(c) overlapping
(d) zero

32. Mean of a set of values is based on
(a) 50% of values
(b) all values
(c) first value and last value
(d) max and min values

33. Pooled mean is also called
(a) Geometric mean
(b) Harmonic mean
(c) Arithmetic mean
(d) grouped mean

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34. Mean deviation is ..... Measure of dispersion
- **(a)** Absolute
- **(b)** relative
- **(c)** both
- **(d)** none

35. Which of the following is not affected by change of origin
- **(a)** Mean (b) median (c) standard deviation (d) none

36. The mean weight of 200 students in class is 80 kg. The mean weight of the boys is 100 kg while that of girls is 60 kg, find the number of boys and girls
- **(a)** 50,100
- **(b)** 100,100
- **(c)** 100,50
- **(d)** none

37. The mean marks scored by 90 students was found to be 30 . Later on it was discovered that a score of 53 was misread as 83. Find the correct mean.
- **(a)** 39.7
- **(b)** 29.67
- **(c)** 29
- **(d)** 39

38. Find the median of the following series 6,10,4,3,9,11,22,18
- **(a)** 9
- **(b)** 10
- **(c)** 9.5
- **(d)** 10.5

39. In a school 100 boys and 50 girls appeared in a public examination. The mean marks of boys was found to be 50% whereas the mean marks of girls was 80%. Determine the average marks percentage of the school.
- **(a)** 45.57%
- **(b)** 45%
- **(c)** 58.5%
- **(d)** 60%

40. In case of an even number of observations which of the following is median
- **(a)** Any of the two middle most value
- **(b)** The simple average of the two middle most values
- **(c)** The weighted average of the two middle value
- **(d)** Any of these

41. The average has relevance for
- **(a)** Homogeneous population
- **(b)** Heterogeneous population
- **(c)** Both
- **(d)** None

42. Which one of the following is absolute measure of dispersion.
- **(a)** Range
- **(b)** Mean deviation
- **(c)** Standard deviation
- **(d)** All of the above

43. The sum of deviations are minimum when taken from the
- **(a)** Mean
- **(b)** Median
- **(c)** Mode
- **(d)** None

44. Arithmetic mean cannot be computed for a distribution with
- **(a)** Inclusive type
- **(b)** Open ends
- **(c)** Exclusive type
- **(d)** All of the above

45. In a more dispersed data
- **(a)** Difference between mean and median is greater
- **(b)** Value of mode is greater
- **(c)** Standard deviation is greater
- **(d)** Both a and b

46. Mean of 0.3,5,6,7,9,12,0.2 is
- **(a)** 4.9
- **(b)** 5.1
- **(c)** 10.5
- **(d)** 12.5

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47. If the mean of 2,x,y is 8 then mean of x,y,8 is
(a) 8
(b) 12
(c) 9
(d) 10

48. Mean =60 ,mode = 58 find median
(a) 59
(b) 58
(c) 60
(d) 59.33

49. The average marks of a group of 50 students is 40 and of another group of 40 is 70,while the third group has an average of 80. Find the number of students in the last group if the average of the total group is 60.
(a) 60
(b) 50
(c) 40
(d) 30

50.

Marks	5-14	15-24	25-34	35-44	45-54	55-64
No of students	10	18	32	26	14	10

What is the value of mean
(a) 30
(b) 29
(c) 33.68
(d) 33.21

51. From the following calculate standard deviation and variance

5,15,25,35,45,55
(a) 15,225
(b) 13,169
(c) 14.169
(d) 17,290

52. Calculate the mode from the following data of the marks obtained by 10 students

20,30,31,32,25,30,31,30,32,25
(a) 3
(b) 25
(c) 30
(d) None

53. Since "it" is positional average so it does not have mathematical properties. What is "it"?
(a) Mean
(b) Median
(c) Mode
(d) None

54. If we want to find the most common size of garment we should use
(a) Mean
(b) Median
(c) Mode
(d) Can use all of the above as all are central tendency

55. Which of the following central tendency can be used if the sample contains extremeobservation
(a) Mean
(b) Median
(c) Mode
(d) All of the above

56. Compute the S.D

9,5,8,6,2
(a) 2
(b) 2.45
(c) 3
(d) 3.5

57. If coefficient of variation is 12.5% and standard deviation is 100 then mean is
(a) 125
(b) .125
(c) 500
(d) 800

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58. 50 students took up a test , the result of those who passed is given below

Marks	No of students
4	8
5	10
6	9
7	6
8	4
9	3

If the average of all 50 students was 5.16,find the average of those who failed

(a) 2.8
(b) 5.925
(c) 2.1
(d) 3

59. The mean of 99 items is 55. The value of 100^{th} is 99 more than the mean of 100 items,what is he value of 100^{th} item

(a) 54
(b) 65
(c) 155
(d) 56

60. The mean of a,b,c is same as that of b,c,d. Then which of the following is correct

(a) a=b=c
(b) b=c=d
(c) b=c
(d) a=d

61. Find mean of the following:
20,21,23,34,40,55,34,32,58,90

(a) 40
(b) 407
(c) 40.7
(d) 34.7

62. If standard deviation of 2x+3=8 then variance of 3x/2 is

(a) 24
(b) 36
(c) 6
(d) 18

63. If mean =50, median =51 then mode is

(a) 52
(b) 53
(c) 54
(d) 55

64. Find mode of the following :
5,6,7,8,9,3,4,2

(a) 1
(b) 5
(c) 8
(d) There is no mode for the above.

65. If the mean mark of class 9 is 45 and that of class10 is 50 find the common average if thereare 50 students in class 9 and 60 students in class 10

(a) 47.72
(b) 48
(c) 50
(d) 55

66. Which of the following data is more reliable
Sample A- S.d=2
Sample B-S.d=3

(a) A
(b) B
(c) Cannot say
(d) Both a and b

67. If all values of the sample are same then variance will be

(a) 1
(b) 0
(c) Cannot be calculated
(d) None of the above

68. If average weight of a class is 45 kg find the weight of a new student, inclusion of whose weight increases it to 47.There were 52 students.

(a) 100 kg
(b) 47 kg
(c) 45 kg

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(d) 151 kg

69. The variance of a distribution is ----- of the origin and ----- of change of scale
(a) Independent, independent
(b) Dependent, dependent
(c) Dependent, independent
(d) Independent, dependent

70. The variance of 100 is
(a) 10
(b) b)100
(c) c)10000
(d) cannot calculate

71. Find the mean and standard deviation of the following:
9,5,8,6,2
(a) 8,2
(b) 6,2
(c) 6,2.45
(d) 8,2.5

72. The position of _____ is such that in the distribution the number of observations above is equal to the number below it
(a) Mean
(b) Median
(c) Mode
(d) Trend line

73. The square of standard deviation is called
(a) Coefficient of variation
(b) Coefficient of s.d
(c) Variance
(d) Square of mean

74. The average friend requests for a week excluding Sunday on FACEBOOK was 10. On Sunday it rose to 15.How many friends visited you on Sunday.
(a) 45
(b) 15
(c) 35
(d) 20

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ANSWER

1	(c)	**2**	(a)	**3**	(a)	**4**	(a)	**5**	(c)	**6**	(c)	**7**	(c)
8	(c)	**9**	(d)	**10**	(a)	**11**	(a)	**12**	(a)	**13**	(c)	**14**	(d)
15	(d)	**16**	(a)	**17**	(b)	**18**	(d)	**19**	(c)	**20**	(a)	**21**	(d)
22	(c)	**23**	(b)	**24**	(b)	**25**	(b)	**26**	(d)	**27**	(a)	**28**	(d)
29	(a)	**30**	(c)	**31**	(c)	**32**	(b)	**33**	(d)	**34**	(a)	**35**	(c)
36	(b)	**37**	(b)	**38**	(c)	**39**	(d)	**40**	(b)	**41**	(b)	**42**	(d)
43	(a)	**44**	(b)	**45**	(c)	**46**	(b)	**47**	(d)	**48**	(d)	**49**	(d)
50		**51**		**52**		**53**	(b)	**54**	(c)	**55**	(c)	**56**	
57		**58**	(c)	**59**	(c)	**60**	(d)	**61**	(c)	**62**	(c)	**63**	
64	(d)	**65**	(a)	**66**	(a)	**67**	(b)	**68**	(d)	**69**	(d)	**70**	(c)
71	(c)	**72**	(b)	**73**	(c)	**74**	(a)						

CHAPTER 9 MATHEMATICS OF FINANCE

All money dealing are associated with three factors, i.e. Principal; Rate of Interest and Time. Computations of simple interest, compound interest, present and future values of annuities and nominal and effective rate of interest etc. are directly based on the above three factors. These computations are known as mathematic of finance.

INTEREST:

The money we borrow is called PRINCIPAL, the extra money we pay is called INTEREST and the total money we pay back to the money lender (or bank) at the end of specified period is called AMOUNT.

Thus, Amount = Principal + Interest or A = P + I.

Where A = Amount; P = Principal and I = Interest

Interest depends on the money borrowed and the duration of time for which it is borrowed. Interest is calculated in per cent of the principal for each year, usually called Rate of Interest. Thus rate per cent per annum is the interest on ₹100 for one year. 'Rate is generally denoted by R'.

KINDS OF INTERESTS:

There are two kinds of interests

(i) Simple interest

(ii) Compound interest

Simple Interest:

When the interest is calculated only on the principal initially invested for each year of its use, it is called simple interest. In other words, if the interest is calculated uniformly on the original principal throughout the loan period, it is called a simple interest.

Compound Interest:

If a borrower does not pay the interest at the end of the prescribed period as in the case of simple interest but adds it to the principal during the next period and so on for further periods, the interest thus calculated is called compound interest. The period at which interest is added is usually quarterly, half-yearly or yearly.

CONCEPT OF SIMPLE INTEREST

Simple interest = (PxTxR)/100

Where P = principal

T= time

R = rate of interest

Amount= Simple Interest + Principal

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CONCEPT OF COMPOUND INTEREST:

AMOUNT	INTEREST COMPOUNDED	NUMBER OF CONVERSION
$A = p(1+i)^n$	Annually	1
$A = P\left(1+\frac{i}{2}\right)^{2n}$	Half-yearly	2
$A = P\left(1+\frac{i}{4}\right)^{2n}$	Quarterly	4
$A = P\left(1+\frac{i}{12}\right)^{12n}$	Monthly	12
$A = P\left(1+\frac{i}{365}\right)^{2n}$	Daily	365

ANNUITY:

A series of payments, usually equal in size, made at equal intervals of times in called an annuity.

Monthly Rental payments; premiums of life insurance; deposits into a recurring account in a bank; equal monthly payment got by a retired government servant as pension and loan installment of houses or automobiles.

SOME TERMS RELATED WITH ANNUITIES:

1. **Periodic Payment: -** The size of each payment of an annuity is called the periodic payment (or periodic rent) of the annuity.
2. **Annual Rent:** - The sum of all payments made in one year of an annuity is called is its annual rent.
3. **Payment Period:** - The time between two successive payments of an annuity is called the payment period (or payment interval) of the annuity.
4. **Term:** - The total from the beginning of the first payment period to the end of the last payment period is called the term of the annuity.
5. **Amount of an Annuity:** - The total worth of all the payments at the conclusion of an annuity is called the amount (or future value) of the annuity.
6. **Present Value of an Annuity:** - The sum of the present values of all the payments of an annuity is called the present value (or capital value) of the annuity.

TYPES OF ANNUITY:

(a) Ordinary Annuity: - When all the periodic payments are made at the end of each payment period, it is called regular annuity (or ordinary annuity). In this case, first, second, third, ...payments respectively fall due at the end of first, second, third, ... Intervals.

(b) Annuity Due: - When all the periodic payments are made at the beginning of each payment period, it is called an annuity due. In this case, first second, third,... payments respectively fall due at the beginning of first, second, third, ... Intervals.

(c) Deferred Annuity: - An annuity which commences after a certain period is called a deferred annuity. In this case, the money is allowed to accumulate for a certain period of time equivalent to a fixed number of payment intervals and the payments begin after the lapse of that period.

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(d) **Contingent Annuity:-** An annuity which is paid or received till the happening of contingency or emergency like life insurance.

(e) **Perpetual Annuity:-** An annuity which is paid or received for lifelong like pension scheme.

CALCULATION OF FUTURE VALUE AND PRESENT VALUE:

ANNUITY REGULAR (ORDINARY):

Future Value = $A/i\ [(1+i)^n - 1]$

Present Value = Future value$/(1+i)^n$

ANNUITY DUE (IMMEDIATE):

Future Value = $A/i\ [(1+i)^n - 1][1+i]$

Present Value = {Future value$/(1+i)^n$ **}+** A

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OBJECTIVE QUESTION

1. Simple interest on 3500 for 3 years at 12% p.a
(a) 1200
(b) 1250
(c) 1260
(d) None

2. A sum of money doubles itself in 10 years then it would triple itself in
(a) 25 years
(b) 15 years
(c) 20 years
(d) None

3. Sangita borrowed 5120 at 12.5 % CI, at the end of 3 years the money was repaid along withinterest . then the amount of interest paid by her is
(a) 2100
(b) 2170
(c) 2000
(d) None

4. A sum of 1200 becomes 1323 in 2 years at CI compounded annually, find the rate of interest
(a) 4%
(b) 6%
(c) 7%
(d) 5%

5. A man borrowed some money and returned it in 3 equal quarterly instalment of 4630.5 each . what sum did he borrow, if the interest was 20% pa calculated quarterly
(a) 12560
(b) 13500
(c) 14560
(d) 12610

6. Find the present value of an annuity due of 500 payable at the beginning of each year for 5 years if the money is worth 6% pa compounded annually
(a) 2732.55
(b) 2232.55
(c) 2920.01
(d) None

7. The difference between SI and CI for 2 years on a certain amount of money at 4% is 160. The amount is
(a) lac
(b) 1 lac
(c) .75 lac
(d) lac

8. If a sum of 3000 amounts to 15000 in 6 years then it will amount to ____ in 30 years
(a) 60000
(b) 42000
(c) 63000
(d) 45000

9. What amount should be set aside each year to accumulate a sum of 10 lacs at the end of 15 yrs at 6% p.a compound interest
(a) 50000
(b) 42963
(c) 45687.94
(d) 43166

10. What is time required for a sum to become 5 times the original sum @8 % pa
(a) 25 years
(b) 50 years
(c) 40 years
(d) 100 years

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11. If raj receives 10000 each year on his birthday for next 5 years @10% pa compounded annually ,what is the present value

(a) 41698.65
(b) 55000
(c) 37920
(d) 42000

12. A bank pays interest @12% compounded quarterly. Find how much should be deposited in the bank at the beginning of each quarter in order to accumulate 10000 in 4 years

(a) 500
(b) 550
(c) 440
(d) 480

13. If a sum yields an interest of 430 in 2 years3 months @5% p.a find the sum

(a) 3740
(b) 3823
(c) 3400
(d) None

14. X, Y and Z are the three sums of money such that Y is the simple interest on X and Z is the simple interest on Y for the same time and rate. The relation between X, Y and Z is –

(a) $x^2 = Y Z$
(b) $Y^2 = Z X$
(c) $Z^2 = X Y$
(d) XYZ = 1

15. An amount of money fetches a simple interest of ₹4,320 at the rate of 4 percent per annum at the end of 6 years. What is the principal amount ?

(a) ₹24,000
(b) ₹12,000
(c) ₹18,000
(d) ₹20,000

16. Q16. If a sum of 23456 becomes 55678 @6% p.a then find the number of years?

(a) 30
(b) 60
(c) 9
(d) 15

17. If a sum of 10000 is invested at 5% and 6.5% for 10 and 8 years respectively then find the difference between interest.

(a) 200
(b) 5000
(c) 5200
(d) 650

18. Find the amount of annuity required to get an amount of 444444 in 5 years compounded semi annually @ 8 % pa

(a) 17094
(b) 683.4
(c) 11555
(d) 37037

19. The difference between compound interest and simple interest on a sum @7% pa for 4 years is 350, find the sum

(a) 12000
(b) 11000
(c) 13000
(d) 11367

20. If a sum is lent for 5 years and amounts to 75000 and later it amounts to 125000 in another 10 years then find the sum.

(a) 25000
(b) 50000
(c) 1000
(d) 5000

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21. Q21. If the present value of a sum paid at the end annually for next 12 years @8 % pa compounded quarterly is 15 lac find the annuity.
(a) 58000
(b) 50000
(c) 48904
(d) 40000

22. Find the present value of ₹10000 invested at the beginning of each year in 20 equal instalment @ 6% p.a compounded annually.
(a) 114698.637
(b) 131580.556
(c) 124650.775
(d) 103245.7498

23. If a sum of 3000 is invested for 5 years @ 7% pa C.I find the interest earned
(a) 4207.655
(b) 1207.6551
(c) 3000
(d) 4245.8

24. If a sum of 12000 is invested for a year @ 9% semiannually but in mid of the year the person withdraws the interest earned then find the value of interest.
(a) 1104.3
(b) 2257.2
(c) 540
(d) 108

25. The sum of money that amounts to ₹1,110 in 10 years at the rate of 5% simple interest will be –
(a) ₹700
(b) ₹740
(c) ₹760
(d) ₹780

26. The simple interest on ₹15,300 from 3rd March, 1997 to 27th July, 1997 at $3\frac{3}{4}\%$ per annum is –
(a) ₹224.50
(b) ₹229.50
(c) ₹234.50
(d) ₹274.50

27. In how many years a sum will be doubled at 12% per annum at simple interest ?
(a) 6 years
(b) 7 years
(c) $8\frac{1}{3}$ years
(d) $8\frac{1}{2}$ years

28. Out of ₹70,000, I invest ₹30,000 at 4% and ₹20,000 at 3%, simple interest. At what rate of interest must I invest the balance so as to get a return of 5% on the whole amount per annum ?
(a) 5%
(b) 7%
(c) 8%
(d) 8.5%

29. The amount of ₹600 will earn ₹300 as simple interest @ 10% per annum in –
(a) 4 years
(b) 5 years
(c) 6 years
(d) 7 years

30. A sum of money at simple interest becomes 1.5 times of itself in 3 years. In how many years will the same treble itself ?
(a) 10 years
(b) 11 years
(c) 12 years
(d) 13 years

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31. The difference between simple interest and compound interest on a certain sum of money at the end of 2 years is ₹117 at 15% per annum, the interest being credited annually. The principal is –
(a) ₹5,200
(b) ₹5,980
(c) ₹6,760
(d) None of these.

32. A sum of money becomes ₹6,500 after 3 years and ₹10,562.50 after 5 years on compound interest. The sum is –
(a) ₹4,000
(b) ₹3,500
(c) ₹3,138
(d) None of these

33. ₹12,500 lent at compound interest for two years at 10% per annum fetches ₹..... more, if the interest was payable half yearly than if it was payable annually –
(a) zero
(b) ₹10.48
(c) ₹38.50
(d) ₹68.82

34. Two friends Gita and Renu invested a total of ₹60,000 together at compound interest at 12.5 % per annum in such a way that Gita gets the same amount after two years what Renu gets after five years. Gita's investment is more than that of Renu by nearly –
(a) ₹10,492
(b) ₹12,470
(c) ₹12,890
(d) None of these

35. The simple interest on a certain sum of money at $3\frac{1}{2}$% per annum for $2\frac{5}{21}$ years is ₹658. The sum is –
(a) ₹7,480
(b) ₹7,840
(c) ₹8,120
(d) ₹8,400.

36. What will be the difference between simple and compound interest on ₹8,000 at the rate of 5 percent per annum at the end of 3 years ?
(a) ₹61.00
(b) ₹122.00
(c) ₹91.50
(d) ₹152.50

37. $\frac{1}{4}$th of a sum is invested at 3% simple interest, $\frac{1}{3}$rd at 4% and the remainder at 5%. If the total yearly interest is ₹150, the sum is –
(a) ₹4,000
(b) ₹3,600
(c) ₹3,000
(d) ₹5,000

38. The difference between compound interest and simple interest on a sum for 3 years at 5% per annum is ₹122. The sum is –
(a) ₹15,000
(b) ₹16,000
(c) ₹12,000
(d) ₹18,000

39. In what time will a sum of 1450 amounts to 2320 at 8 % p.a simple interest
(a) 6.5
(b) 5
(c) 7.5
(d) 5.5

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40. At simple interest rate of $4\frac{3}{4}\%$ per annum, how much time is needed for ₹432 to yield an interest of ₹78.66 ?
(a) 2 years 10 months
(b) 3 years
(c) 3 years and 10 months
(d) 4 years

41. If a sum yields an interest equal to 1/5 th of the sum @ 10 % pa in n years then find the time taken
(a) 10 yrs
(b) 20 yrs
(c) yrs
(d) .2 yrs

42. Find the future value of a sum of 400 paid in each quarter for 10 years @ 5% pa
(a) 16000
(b) 32000
(c) 44000
(d) 20595

43. Find the present value of 40000 due in 15 years @6% p.a.ci semi annually
(a) 16520
(b) 16789
(c) 17520
(d) 16475

44. The annual rent of a free hold estate is 1000 what is its current value if the compound interest is 4% pa ?
(a) 30000
(b) 20000
(c) 25000
(d) None

45. What sum would amount to 12000 in 5 yrs @5% p.a
(a) 9999
(b) 9000
(c) 9800
(d) 9600

46. Find the si on 147 for 6 yrs @12 % p.a
(a) 215
(b) 101
(c) 105
(d) 94

47. Find the present value of an annuity of 10000 per annum for 12 years the interest being 4% pa
(a) 100000
(b) 93700
(c) 95000
(d) 120000

48. The simple interest on a certain sum for 15 months at 8% p.a is 50 more than the si on the same sum for 8 months @ 10 %. The sum borrowed is
(a) 1500
(b) 1700
(c) 2000
(d) 2500

49. Find the compound interest for 1000 for 4 years @ 5 % when compounded quarterly
(a) 215
(b) 220
(c) 218
(d) None

50. The difference between simple interest and compound interest on x sum for 2 years @ 4% p a is ₹ 1 then the value of x is
(a) 100
(b) 300
(c) 500
(d) 625

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ANSWERS

1	(c)	**2**	(c)	**3**	(b)	**4**	(d)	**5**	(c)	**6**	(a)	**7**	(b)
8	(c)	**9**	(b)	**10**	(b)	**11**	(c)	**12**	(d)	**13**	(b)	**14**	(b)
15	(c)	**16**	(d)	**17**	(a)	**18**	(d)	**19**	(d)	**20**	(b)	**21**	(c)
22	(b)	**23**	(b)	**24**	(b)	**25**	(b)	**26**	(b)	**27**	(c)	**28**	(d)
29	(b)	**30**	(c)	**31**	(a)	**32**	(c)	**33**	(d)	**34**	(a)	**35**	(d)
36	(a)	**37**	(b)	**38**	(b)	**39**	(c)	**40**	(c)	**41**	(c)	**42**	(d)
43	(a)	**44**	(c)	**45**	(d)	**46**	(c)	**47**	(b)	**48**	(a)	**49**	(a)
50	(d)												

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TIME FOR NKJ-CLASS TEST !



Dear NKJ Student !

Please Request your Faculty to Conduct Test of Past Chapter and ensure that the test is surely conducted.

Its mandatory !

"Practice makes a man perfect"

CHAPTER 10 PROBABILITY

Probability refers to chance, i.e., chance of happening of some event. Probability theory has a central place in the theory and applications of statistics, since we are analyzing and interpreting data that involve an element of chance or uncertainty. The reliability of our conclusions is supported by accompanying probability statements.

The probability of the occurrence of any event always lies between 0 and 1 and these are the two limits of probability.

Introduction of Sets, Relation & Functions

A set is well defined collection of objects, where by 'well defined' we mean that there is a rule (or rules) by means of which it is possible to say, without ambiguity, whether a particular object belongs to collection or not. The objects in the set can be anything.

The individual object of the collection or set is called an element or a member of the set. Sets are usually denoted by the capital alphabets such as X, Y, Z., etc. and the element of a set are denoted by small alphabets such as x, y, z, etc.

Examples:

(i) The collection of first six even natural numbers is a set containing the element 2, 4, 6, 8, 10, 12.

(ii) The collection of vowels in the English alphabets is a set containing the elements a, e, i, o, u.

(iii) The collection of first four price natural numbers is a set containing the elements 2, 3, 5, 7.

ORDER OF A FINITE SET OR CARDINAL NUMBER:

The number of distinct element in a finite set is called the order of the set. If X is a finite set having m distinct elements, then the order of X is m. symbolically.

O(X) = m, m is also called the cardinal number of the set x. It is also written as n(X) = m

Example:-Let S = {1, 3, 5, 7,9, 11} be a set, then its order is 6. Or the cardinal number of the set is 6.

EQUIVALENT SETS:

Two set A and B are said to be equivalent sets if their cardinal numbers are same, i.e.

n (A) = n (B).

EQUAL SETS:

Two sets A and B are said to be equal if every element of A is an element of B and every element of B is an element of A and it is denoted by A = B.

Example: - Let S = {x | is a vowel and T = {a, e, i, o, u), then S = T.

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NULL SET OR EMPTY SET:

A set having no element is called a null set or a void set or an empty set and is denoted by $\emptyset$.

Example:- The set S = {x | x is an integer and $x^2 = 2$} is, clearly, a null set as there is no integer whose square is 2.

SINGLETON SET:

A set of only one element as its, member, is known as singleton set.

Example: - {1} is a singleton set whose only element is unity.

{Ø}, it is a set whose only element is a null set, therefore, {Ø} is singleton.

SUBSET:

A set is said to be subset of the set Y if every element of the set X is also element of the set Y, i.e., $\forall x \in X \Rightarrow X \in y$. we express it by saying that X is contained in Y or Y contains X. we use the symbol $\subseteq$ to denote the fact that the set X is a subset of Y.

Example: - If A = {1, 2, 3, 4, 5} and B = {3, 5}, then B is a subset of A.

POWER SET:

It is the set of all possible subsets of the given set A and is denoted by P(A), i.e., P(A) = { B I B $\subseteq$ A}. Thus a power set is a family of sets.

For Example. Let A = {2, 3, 4} then, P(A) = {{Ø}, {2}, {3}, {4}, {3, 4} {2, 4}, {2, 3}, {2, 3}, {2, 3, 4}.

DISJOINT SET:

Two sets A and B are said to be disjoint sets if they have no element in common, i.e., their intersection is a null set, i.e., if $A \cap B = \emptyset$

Thus sets A and B are said to be disjoint set if $A \cap B = \emptyset$

The set X = {x I x is an even natural number} and y = {y I y is odd natural number} are disjoint as

$X \cap Y = \emptyset$.

UNIVERSAL SET:

In the mathematical discussion we shall consider we shall consider all the sets to be the subsets of a given large fixed set. Known as Universal Set or Universe of Discourse and is usually denoted by U. i.e. A universal set is the largest non-empty set of which all the sets, under consideration, are subsets.

Example: In a plane geometry the universal set consists of all the points in the plane.

BASIC OPERATIONS OF SETS:

The main operations in the set theory are union, intersection, difference and complement.

UNION OF TWO SETS:- Let A and B be two given sets. Then the union of the two sets A and B is the set of all those elements x such that x belongs to A or x belongs to B or X belongs to both A and B, and is denoted by $A \cup B$, to be read as 'A union B' or A cup B.

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i.e., $A \cup B = \{ x \mid x \in A \text{ or } x \in B \text{ or } x \in A \text{ as well as } x \in B\}$.

Example: - Let A = { a, b, c} and B = {b, c, d}, then

$A \cup B = \{ x \mid x \in A \text{ or } x \in B \text{ or } x \in \text{both A and B}\} = \{a, b, c, d\}$

INTERSECTION OF TWO SETS: - Let A and B be two sets. Then the intersection of two sets A and B is the set of all those elements which belong to A as well as to B and is denoted by $A \cap B$, to be read as A intersection B or A cap B.

i.e., $A \cap B = \{x \mid x \in A \text{ and } x \in B\}$.

Example: - Let R = {2, 4, 6,...} and S = {3, 6, 9,...}, then $R \cap S$ = {6, 12, 18, 24, ...}.

COMPLEMENT OF A SET:

Let U be a universal set and $A \subseteq U$, then the complement of the set A with respect to the universal set U is the difference of the universal set U and the set A. it is denoted by A^c or A' be read as A complement.

Example: - Let N, the set of all natural numbers, be taken as the universal set and let

A = {x l x is an even number and x.....

Random Experiment:

By a random experiment we mean an experiment which when performed repeatedly under essentially homogenous conditions does not give unique result or outcome but may result one of the several possible outcomes. Each performance of experiments is called a trial.

Some examples of random experiment are tossing a coin, rolling a die (singular of dice) and drawing a cared from a deck of 52 playing cards,

Sample Space:

The sample space S, associated with random experiment, is the set of all possible outcomes of the experiment. Each outcome (or element) of a sample space is called a sample point.

Event:

Any subset of the sample space of an experiment is called an event. Events are usually denote4d by single capital letters such as A, B, C and so on.

For example, if a die is rolled, then the set {2, 4, 6}, which is a subset of the sample space, {1, 2, 3, 4, 5, 6} is an event. This event may be described as "an even number appears. Some other events are

A = {2}, B = {1, 2, 3}, C = {1, 2, 3, 4}

Simple Event:

An event that consists of a single outcome of an experiment is called a simple event. For example, for the experiment of rolling a die, the event {2} is a simple event.

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Compound Event:

An event that consists of more than one sample point is called a compound event. For example, for the experiment of rolling a die, the event {2, 4, 6} is a compound event.

Sure or Certain Event:

The sample space S, which is a subset of itself, is called the sure or certain event.

Impossible Event:

An event which does not contain any outcome of an experiment is called an impossible event. The impossible event is denoted by ∅. For example, for the experiment of rolling a die, the event {7} is an impossible event.

Complement of an Event:

The complement of an event A, denoted by A^c or $\overline{A}$ or A', is the event consisting of all sample points in S which are not in A.

Union of Two Events:

The union of two events A and B denoted by A ∪ B, is the event consisting of all sample point that are either in A or in B or in Both A and B.

Intersection of Two Events:

The intersection of two events A and B, denoted by A ∩ B, is the event consisting of all sample point that are common to both A and B.

Occurrence or Happening of an Event:

An event A is said to occur if the outcome of the experiment is a sample point of A. for example, if a die is rolled, then the event A = {2, 4, 6} occurs if the outcome is 2, 4, or 6. Te number of different ways in which A can happen is 3, which is called the number of cases or outcomes favourable to the happening of 4.

Favourable Number of Cases:

The number of outcomes favourable to the happening of an event A is defined as the number of outcomes which entail the occurrence of the simply the number of sample points in A.

For example, if two dice are rolled, and we define the event A as " the sum of the numbers on the two faces is 8". Then A can be represented by A={(2,6),(6,2),(3,5),(5,3)(4,4)}, obviously, the number of outcomes favorable to the happening of A is 5 because this represents the number of different ways in which A can happen.

Equally Likely Events:

Two or more events are said to be equally likely if each has the same chance of occurrence.

Mutually Exclusive Events:

Two or more event of a sample space are said to be mutually exclusive if and only if one of them occur at a time, i.e., if the occurrence of one event precludes the occurrence of all the other events. For example, if tossing a coin, the events "head" and " tail" are mutually exclusive.

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Exhaustive Events:

Two or more events of a sample space are said to be exhaustive if their union is the sample space. Thus the events $A_1, A_2, \ldots\ldots\ldots, A_n$ are exhaustive if

$$A_1 \cup A_2 \cup A_n = S, \text{ where S is the sample space.}$$

For example, in tossing a coin, the events "head" and "tail" are exhaustive.

APPROACHES TO PROBABILITY:

There are three ways of defining of notion of probability. These are:

1. The classical or the mathematical approach.
2. The empirical or the statistical approach.
3. The axiomatic approach.

All three of these approaches help one to understand the important and useful concept of probability. The classical and the statistical definition of probably are both used in the study and applications of probability. The axiomatic approach, introduced in the twentieth century, consists of a set of axioms. The axiomatic approach exhibits the logical structure of probability theory and it opens the way for intense mathematics study of the subject.

THE CLASSICAL DEFINITION OF PROBABILITY:

The classical definition is the oldest definition of probability. It was used extensively by earlier workers such as Blaise Pascal in connection with games of chance.

Definition:-

Let a random experiment result in n equally likely, mutually exclusive and exhaustive sample events and let m (out of n) be the number of outcomes favourable to the happening of an event A, then the probability of happening of A, denoted by P(A), is defined as

$$P(A) = m/n = \frac{\text{number of outcomes favourable to A}}{\text{total number of outcomes}}$$

Equivalently, $P(A) = \frac{n(A)}{n(S)}$,

Where n(A) is the number of outcomes in A and n(S) is the number of outcomes in S.

REMARKS:

1. It follows immediately from the definition that for any event A, we have

$$0 \le P(A) \le 1$$

2. The symbol $P(\bar{A})$ or $P(A^c)$ is used to denote the probability of non-happening of an event A. Thus

$$P(\bar{A}) = \frac{\text{number of outcomes favourable to non-happening of A}}{\text{total number of possible outcomes}}$$

$$= \frac{n-m}{n} = 1 - \frac{m}{n} = 1 - P(A)$$

$$P(\bar{A}) = 1 - P(A).$$

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3. Sometimes, the probability of an event is expressed in terms of odds-either odds in favour of an event or odds against an event. If A is any event, then

(i) The odds in favour of A are $\frac{P(A)}{P(A)}$ or P(A) : P($\bar{A}$)

(ii) The odds against A are $\frac{P((\bar{A})}{P(A)}$ or P($\bar{A}$) : P(A)

For example, If the probability of an even A is 2/3, then the odds in favour of A are $\frac{2/3}{1/3}$

Or 2 : 1 and the odds against A are $\frac{1/3}{2/3}$ or 1 : 2

To find the probability of an even A when either the odds in favour of A or the odds against A are known, we use the following:

If the odds in favour of A are m : n, then P(A) = $\frac{m}{m+n}$: and

If the odds against A are m : n, then P(A) = $\frac{n}{m+n}$.

Limitations:

The classical definition of probability has its shortcomings and limitations in the following situations.

1. The classical probability cannot be applied in situations in which the possibilities that arise cannot be regarded as equally likely. This would be the case, for instance, if we are concerned with the question whether it will rain on a given day.
2. It also fails in situations in which n, the exhaustive number of outcomes of a random experiment, is infinite. This drawback is overcome in the statistical or the empirical definition of probability.

EMPIRICAL OR STATISTICAL DEFINITION OF PROBABILTY:

Definition: - If an experiment be repeated a large number of times under essentially identical conditions, the limiting value of the ratio of the number of times an event A occurs to the number of times the experiment is conducted as the number of trials of the experiment increases indefinitely, is called the probability of occurrence of A.

Thus if n is the number of times an experiment is conducted and m is the number of times an event A occurs, then the probability of occurrence of the event A is given by

$$P(A) = \lim_{n\to\infty} \frac{m}{n}$$

REMARK: -The empirical definition of probability provides validity to the classical theory of probability. If an unbiased coin is tossed, then the classical approach gives the probability of a head as 1/2. This means if we toss an unbiased coin, say 20 times, this classical approach suggests that we should get head 10 times. However, in practice, this will not generally be true. In fact, in 20 throws of a coin, we may get no head at all or 1 or 2 heads. However, the empirical definition of probability suggests that if a coin is tossed a large number of times, say 500, we should expect on an average 250 heads and 250 tails.

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Limitations: The empirical or statistical definition of probability has the following limitations:

1. The experimental conditions may not remain essentially homogeneous and identical if it is repeated a large number of times.
2. The ratio m/n may not attain a unique value, no matter however larger n may be:

AXIOMATIC APPROACH:

The axiomatic approach introduced by the Russian mathematics, A.M. Kolmogorov in the twentieth century consists of a set of axioms and is based on the logical structure of probability.

Definition:- Let S be a sample space. S is called a **probability space** it for every event A in S, there is a number P (A) with the following three properties:

(i) $0 \leq P(A)$

(ii) $P(S) = 1$

(iii) $P(A \cup B) = P(A) + P(B)$ whenever A and B are two events with $A \cap B = \emptyset$.

In this definition, P is called the probability function and P(A) is called the probability of the event A.

ADDITION THEOREM OF PROBABILITY:

Addition Theorem:- If A and B are any two events of a sample space S, then

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Additions Theorem for Mutually Exclusive Events:

If events A and B are mutually exclusive, i.e. if $A \cap B = \emptyset$, then the probability of occurrence of the event A or B is the sum of their respective probabilities. That is .

$$P(A \cup B) = P(A) + P(B)$$

Generalized Addition Theorem:- If A, B and C are three events of a sample space S, then the probability of occurrence of at least one of them is given by

$$P(A \cup B \cup C) = P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C) + P(A \cap B \cap C)$$

In particular, if A, B and C are mutually exclusive, then

$$P(A \cup B \cup C) = P(A) + P(B) + P(C)$$

Two Important formulas:- If A and B are two events of a sample space S, then

(i) $P(A \cap \bar{B}) = P(A) - P(A \cap B)$

(ii) $P(\bar{A} \cap B) = P(B) - P(A \cap B)$

CONDITIONAL PROBABILITY:

Definition:- Let A and B be two events such that P(B) >0. Then the probability that event A occurs assuming that event B has already occurred is called the conditional probability of A given B. This is written symbolically as P(A/B) and is read "the probability that A occurs given that B has occurred".

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INDEPENDENT EVENTS:

Definition:- Two events are said to be independent if occurrence or non-occurrence of either of them does not affect the probability of the occurrence of the other. If the events are not independent, we say that they are dependent.

Multiplication Theorem:- If A and B are any two events of a sample space S, then

$$P(A \cap B) = P(A).\ P(B/A), \quad P(A) > 0$$

Alternatively $P(A \cap B) = P(B).\ P(A/B), \quad P(B) > 0$

Corollary 1. : - If A and B are two events of a sample space S, then

(i) $P(A/B) = \frac{P(A \cap B)}{P(B)}, \quad P(B) \neq 0$

(ii) $P(B/A) = \frac{P(A \cap B)}{P(A)}, \quad P(A) \neq 0$

Corollary 2. :- Multiplication Theorem for Independent Events:- If two events A and B are independent, then $P(A \cap B) = P(A).\ P(B)$

That is, the probability of joint occurrence of two independent events is the product of their respective probabilities.

RANDOM VARIABLE:

Definition: -

A random variable is function that assigns a real number to each outcomes of an experiment.

Thus a random variable is a function from the sample space to an experiment into the set of real numbers. Usually, random variables are dented by capital letters such as X, Y and Z and the values that these variables assume may be denoted by corresponding lower case letters x, y or z.

Discrete and continuous Random Variables:-

There are two types of random variables, viz., discrete and continuous.

A discrete random variable

is a random variable that can assume only a finite number of values or if its values can be placed in one-to-one corresponding with the positive integers.

A continuous random variable

is a random variable that can assume any value in some interval.

For example, random variable defined in Example 100 (c) is continuous. Similarly, the heights and weights of the students in a class represent continuous random variables

DISCRETE PROBABILITY DISTRIBUTION:

A discrete random variable assumes each of its value with a certain probability. For example, in the case of tossing a coin 3 times, the random variable X, representing the number of heads, assumes the value 2 with probability 3/8, since 3 of the eight equally likely outcomes result in 2 heads and 1 tail. We can list all possible values of X along with the associates probabilities in a table, called a discrete probability distribution, as shown below:

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X	:	0	1	2	3
P(X=x)	:	1/8	3/8	3/8	1/8

This table contains two rows. The first lists the values the random variable X can take on and the second lists the corresponding probabilities.

Definition:-

A table listing all possible values that a discrete random variable can take on, along with the associated probabilities, is called a discrete probability distribution.

If X is a discrete random variable that can take on values x_1, x_2, ...x_n with the corresponding probabilities p_1, p_2, ...p_n, then probability distribution of X is given by

X	:	x_1	x_2	.....	x_n
P(X=x)	:	p_1	p_2	....	p_n

Frequently, it is convenient to represent all the probabilities of a random variable by a formula, which may also be termed as the probability distribution of the random variable. Such a formula whole necessarily be a function defined on the range space of X. Thus if X is a discrete random variable, then a function P defined on the range space of X by

$$P(x) = P(X=x)$$

Is the probability of X.

NOTE 1.:- Since any two of the events $X = x_1$, $X=x_2$, ..., $X=x_n$ are mutually exclusive and the union of these is the sample space, we note that for any probability distribution,

$$\sum_{i=1}^{n} p_1 = p_1 + p_2 + ...+ p_n$$

NOTE 2.: - It may be noted that

(i) $P(X \le x_i) = P(X=x_1) + P(X=x_2) + ... + P(X=x_i) = p_1 + p_2 + ...+ p_i$

(ii) $P(X > x_i) = 1 - P(X \le x_i) = 1 - (p_1 + p_2 + ...+ p_i)$.

OBJECTIVE QUESTION

1. Two unbiased dice are thrown together. The probability that the sum of the digits on the dice is more than 8 is

(a) $\frac{5}{18}$

(b) $\frac{5}{12}$

(c) $\frac{13}{18}$

(d) $\frac{7}{12}$

2. Two unbiased dice are thrown together. The probability that both the digits on dice are even is

(a) $\frac{1}{2}$

(b) $\frac{1}{4}$

(c) $\frac{3}{4}$

(d) None

3. Two unbiased dice are tossed together. The probability that the sum of the digits on dice are divisible by 3 or 4 is

(a) $\frac{5}{9}$
(b) $\frac{7}{12}$
(c) $\frac{4}{9}$
(d) $\frac{5}{12}$

4. Two unbiased dice are thrown simultaneously. The probability that the sum of the digits is 15 is

(a) $\frac{5}{216}$
(b) $\frac{5}{108}$
(c) $\frac{5}{54}$
(d) None

5. Two unbiased dice are thrown simultaneously. The probability that the sum of the digits is 11is

(a) $\frac{5}{216}$
(b) $\frac{5}{108}$
(c) $\frac{5}{54}$
(d) 1/9

6. A number is selected at random from number 200 to 500. The probability that is divisible by 7 is

(a) $\frac{41}{300}$
(b) $\frac{40}{300}$
(c) $\frac{42}{300}$
(d) None

7. Family-1 has 2 boys & 2 girls, Family-2 has 3 boys and 2 girls and a Family-3 has 4 boys and 1 girls. If a child is selected at random from each family, then the probability that all are of same sex is

(a) 0.24
(b) 0.04
(c) 0.72
(d) 0.28

8. Three families consist of 3 boys and 2 girls, 2 boys and 2 girls, and 2 boys and 3 girls respectively. A family is selected at random and from it two children are selected. What is the probability that both of them are girls?

(a) 0.20
(b) 0.12
(c) 0.04
(d) None

9. An item consists of two parts *A and B*. The probabilities that they are non-defective is 0.95 and 0.97 respectively. What is the probability that the item is defective?

(a) 0.08 **(b)** 0.0785
(c) 0.9215 **(d)** 0.0015

10. What is the probability that a family of 2 children has both the children of same sex?

(a) $\frac{1}{3}$
(b) $\frac{1}{2}$
(c) $\frac{2}{3}$
(d) None

11. It is given that a family of 2 children has a girl. What is the probability that the other child is also a girl?

(a) $\frac{1}{3}$
(b) $\frac{1}{2}$
(c) $\frac{2}{3}$

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(d) None

12. If probability that horse *A* wins the race is 1/5 and that horse *B* wins is1/4. What is the probability that at least one of them wins the race?

(a) $\frac{1}{9}$

(b) $\frac{9}{20}$

(c) $\frac{1}{20}$

(d) $\frac{2}{5}$

13. If on an average 8 trucks out of 10 trucks return safely to a transport company, the probability that one truck does not reach safely is

(a) $\frac{1}{10}$

(b) $\frac{18}{10}$

(c) $\frac{2}{10}$

(d) None

14. The probability of the occurrence of a digit greater than 2 in a throw of single unbiased die, if it is known that only even numbers can occur is

(a) $\frac{2}{3}$

(b) $\frac{1}{3}$

(c) $\frac{1}{2}$

(d) None

15. The probability that the 7^{th} day of a randomly chosen month of a randomly chosen year will be Sunday is

(a) $\frac{1}{7}$

(b) $\frac{2}{7}$

(c) $\frac{1}{14}$

(d) $\frac{1}{84}$

16. Three person *A, B* and *C* aim a target. The respective probability of their hitting the target is 2/3, 1/4 and ½. What is the probability that at least two of them will hit the target?

(a) $\frac{3}{8}$

(b) $\frac{11}{24}$

(c) $\frac{2}{24}$

(d) $\frac{1}{3}$

17. For three mutually exclusive and exhaustive events *A,B* and *C,2P(A)=3P(B=)=P(C).* What is *P(BUC)?*

(a) $\frac{6}{11}$

(b) $\frac{5}{11}$

(c) $\frac{9}{11}$

(d) $\frac{8}{11}$

18. A wholeseller can do a business of ₹ 80,000 in a normal day and do a business of ₹ 50,000 if the condition are not in favour of business. Also he can do a business of ₹ 90,000 if the conditions are in favour of business. The chance of normal condition, unfavourable condition and favourable condition are respectively 60%, 30% and 10%. What is his expected business?

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(a) ₹72000
(b) ₹48000
(c) ₹56000
(d) None

19. Mr. Modi thinks of selling the umbrella. But his profit depends on the season. There is 40% chance of good rainfall . if it rains then he will make a profit of 50000 and if it does not then he will make a profit of just 5000.Then his expectation from the business is
(a) ₹2000
(b) ₹23000
(c) ₹5000
(d) None

20. A box contains 2 white and 4 black balls. A person selects 3 balls at random and receives ₹ 10 for each white ball and ₹20 for each black ball. What is his expectation ?
(a) 6
(b) 10
(c) 50
(d) None

21. What is the probability of getting 53 Sundays in a leap year ?
(a) 2/7
(b) 1/7
(c) 1/53
(d) 1/366

22. What is the probability of geeting a sum of 13 in two throws of the same dice ?
(a) 1/2
(b) 1/36
(c) 1/6
(d) 0

23. A company has 5 graduates and 15 non graduates . if 3 person are selected what is the chance of selecting at least 2 graduates ?
(a) 8/57
(b) 9/57
(c) 10/57
(d) 11/57

24. 24.What is the probability of getting a queen of spade from a pack of cards?
(a) 1/13
(b) 1/52
(c) 4/13
(d) none

25. 25.What is the probability of getting a king of club or queen of hearts?
(a) 1/26
(b) 1/13
(c) 1/52
(d) 2/13

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ANSWERS

1	(a)	**2**	(b)	**3**	(a)	**4**	(d)	**5**	(d)	**6**	(c)	**7**	(d)
8	(a)	**9**	(b)	**10**	(b)	**11**	(b)	**12**	(d)	**13**	(c)	**14**	(b)
15	(d)	**16**	(b)	**17**	(d)	**18**	(a)	**19**	(b)	**20**	(c)	**21**	(a)
22	(d)	**23**	(a)	**24**	(b)	**25**	(a)						

CHAPTER 11 REVIESE YOURSELF

1. Which of the following assumption is not true for production function?
   (a) Inputs can be variable
   (b) Technology is variable
   (c) Output is variable
   (d) All of the above

2. Which of the following is not related to agricultural linkages?
   (a) Demand linkage
   (b) Supply linkage
   (c) Saving linkage
   (d) Cost linkage

3. If AR > MR then we are in which market?
   (a) Monopoly
   (b) Monopolistic
   (c) Oligopoly
   (d) All of the above

4. If AC= 100 and MR=150 then the perfect competitive firm is making total profit of
   (a) 50
   (b) 100
   (c) 150
   (d) It cannot be calculated since quantity is not given

5. Which of the following monetary policy is applicable if there is deflation in the economy?
   (a) Increase the bank rate and decrease the CRR
   (b) Decrease the bank rate and decrease the CRR
   (c) Increase the bank rate and increase the CRR
   (d) Decrease the bank rate and increase the CRR

6. If 15th labour decreases the TP by 20 then
   (a) TP is negative
   (b) TP is falling
   (c) MP is negative
   (d) Both b and c

7. If proportionate change in price is greater than the proportionate change in demand then
   (a) TR will increase when Price decreases
   (b) TR will decrease when price increases
   (c) TR will increase when price will increase
   (d) None

Answer the following questions from the following table

Quantity	TC	FC	VC	AFC	AVC	AC	MC	M
0	500							
1	1200							
2	1600							
3	1800							
4	3000							

IF price of each product is sold at 1500 then answer the following

8. Find the average fixed cost at q=4
   (a) 750
   (b) 1200
   (c) 125
   (d) 500

9. Find the variable cost at q=3
   (a) 1800
   (b) 1300
   (c) 600
   (d) 200

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10. Q10. Find the MR for the 2nd unit
- **(a)** 1500
- **(b)** 3000
- **(c)** 4500
- **(d)** 5500

11. Find the AC of 3 unit
- **(a)** 1500
- **(b)** 1800
- **(c)** 300
- **(d)** 600

12. Q12.find the equilibrium level
- **(a)** 1 unit
- **(b)** unit
- **(c)** unit
- **(d)** None

13. Q13. Find the profit at 4th unit
- **(a)** 1500
- **(b)** 3000
- **(c)** 4500
- **(d)** None

14. If q=200+5p then elasticity at p=10
- **(a)** -1/5
- **(b)** 1/5
- **(c)** 5
- **(d)** -5

15. On an Indifference curve_____ is variable but _____ is constant
- **(a)** Satisfaction, commodity bundles
- **(b)** Commodity bundles, satisfaction
- **(c)** Income, satisfaction
- **(d)** Satisfaction, income

16. The first annual plan was introduced as an after effects of
- **(a)** Bangladesh war
- **(b)** Pakistan war
- **(c)** Sino war
- **(d)** Both b and c

17. The total share of land area of India among world is
- **(a)** 5%
- **(b)** 3%
- **(c)** 2%
- **(d)** 2.7%

18. Nationalization of banks was done in the _____ plan
- **(a)** 4th plan
- **(b)** 5th plan
- **(c)** 6th plan
- **(d)** 3rd plan

19. Disguised Unemployment is found in
- **(a)** Primary sector
- **(b)** Secondary sector
- **(c)** Tertiary sector
- **(d)** All of the above

20. The sex ratio in India is
- **(a)** 900/1000
- **(b)** 920/1000
- **(c)** 930/1000
- **(d)** 933/1000

21. Which state suffers from the highest form of unemployment?
- **(a)** Orissa
- **(b)** West Bengal
- **(c)** Kerala
- **(d)** Manipur

22. If 2500 amounts to 5500 in 6 yrs how much will it amount to in 10 years?
- **(a)** 5000
- **(b)** 10500
- **(c)** 8000
- **(d)** 7500

23. If events A and B are independent P(A)=2/3, P(B)=3/5 then P(A+B)=?
- **(a)** 13/15
- **(b)** 6/15
- **(c)** 1/15
- **(d)** None

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24. In what time ₹8000 amounts to 40000@4% p.a. SI?
- **(a)** 100yrs
- **(b)** 50yrs
- **(c)** 110yrs
- **(d)** 160yrs

25. In a school 100 boys and 50 girls appeared in a public examination. The mean marks of boys was found to be 50% whereas the mean marks of girls was 80%. Determine the average marks percentage of the school.
- **(a)** 45.57%
- **(b)** 45%
- **(c)** 58.5%
- **(d)** 60%

26. The index for the base period is always taken as
- **(a)** 10
- **(b)** 100
- **(c)** 1000
- **(d)** None

27. Which of the following activities cannot take place in short run?
- **(a)** Changing the quantity of labour employed
- **(b)** Changing the input combination
- **(c)** Regular maintenance of the plant to ensure efficient production
- **(d)** Installation of an additional plant to meet requirements

28. A serious effort to tackle the problem of poverty began with
- **(a)** First plan
- **(b)** Second plan
- **(c)** Fifth plan
- **(d)** Sixth plan

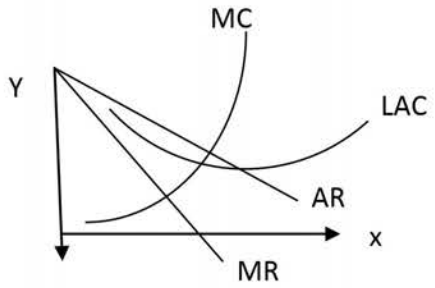
29. When price of both substitute and complement of a good rise, then demand of the product
- **(a)** Rises
- **(b)** Falls
- **(c)** Remain unchanged
- **(d)** May rise or fall or remain unchanged

30. Organization which does not facilitate the process of globalization
- **(a)** IMF
- **(b)** WORLD BANK
- **(c)** ASIAN BANK
- **(d)** WTO

31. Diminishing marginal returns is exhibited by
- **(a)** 50,50,50,50
- **(b)** 50,110,180,260
- **(c)** 50,100,150,200
- **(d)** 50,100,130,150

32. Under monopoly the degree of monopoly power is
- **(a)** Zero
- **(b)** Full
- **(c)** Limited
- **(d)** Unlimited

33.



Which market form does the above figure illustrate?
- **(a)** Perfect competition
- **(b)** Monopolistic market
- **(c)** Monopoly
- **(d)** Duopoly

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34. Using the fig. in q33. Point out whether the firm is earning
- **(a)** Profit
- **(b)** Loss
- **(c)** No profit no loss
- **(d)** Normal profit

35. The unit of measurement in tabulation is shown in
- **(a)** Caption
- **(b)** Box head
- **(c)** Body
- **(d)** Stub

36. The best method to collect data in case of natural calamity is
- **(a)** Indirect interview
- **(b)** Telephonics
- **(c)** Direct interview
- **(d)** Personal interview

37. Annuity payable for fixed number of intervals is called
- **(a)** Annuity perpetual
- **(b)** Annuity due
- **(c)** Annuity certain
- **(d)** Annuity payable

38. The period of time for which interest is calculated is called
- **(a)** Accounting period
- **(b)** Interest period
- **(c)** Conversion period
- **(d)** Time period

39. When AR> AC then the firm derives
- **(a)** Increasing returns
- **(b)** Decreasing returns
- **(c)** Constant returns
- **(d)** None

40. The government established _____in 1982 to finance rural projects at lower rate of interest
- **(a)** Regional rural banks
- **(b)** Reserve bank of India
- **(c)** Co operative banks
- **(d)** NABARD

41. If Marginal cost is less than marginal revenue then the producer should
- **(a)** Decrease the output
- **(b)** increase the output
- **(c)** keep the output constant
- **(d)** None of the above

42. The Bhabha atomic research centre was established in
- **(a)** First plan
- **(b)** second plan
- **(c)** third plan
- **(d)** fourth plan

43. If demand increases more than the supply then price would
- **(a)** Increase
- **(b)** decrease
- **(c)** remains same
- **(d)** cannot say

44. If we move from a point inside the PPC to the point in the PPC then there will be
- **(a)** Decrease in unemployment
- **(b)** increase in unemployment
- **(c)** growth
- **(d)** all of the above

45. The rate at which commercial bank takes loan from RBI is called
- **(a)** Bank rate
- **(b)** Repo rate
- **(c)** reverse repo rate
- **(d)** primary lending rate

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46. In long run monopolistic firm would earn
- **(a)** Normal profit
- **(b)** super normal profit
- **(c)** loss
- **(d)** none

47. If AR=80 and AC= 100 and the firm is selling 200 units then the total profit is
- **(a)** 20
- **(b)** 2000
- **(c)** 1000
- **(d)** 4000

48. If an industry is going through decreasing returns to scale then the LAC will be
- **(a)** Diminishing slope
- **(b)** increasing slope
- **(c)** no slope
- **(d)** vertical

49. BIFR stands for
- **(a)** Bureau of Indian reform
- **(b)** Bureau of fundamental research
- **(c)** Bureau of industrial financial reconstruction
- **(d)** none

50. If e_p=2 and price decreases by 30% the change in demand will be
- **(a)** 15%
- **(b)** 60% increase
- **(c)** 60% decrease
- **(d)** 60%

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Answers

1b	2d	3d	4d	5b	6d
7c	8c	9b	10a	11d	12d
13b	14b	15b	16d	17d	18a
19a	20d	21c	22d	23a	24a
25d	26b	27d	28c	29d	30c
31d	32d	33b	34d	35d	36d
37c	38c	39a	40d	41b	42b
43a	44a	45b	46a	47d	48b
49c	50b				

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